9.0 Conservation, Renewable Resources and Low Income Energy Services

Scope: ESSB 6560 directs the UTC and CTED to study and report on current levels of investment in conservation, non-hydro renewable resources, and low income energy services; trends affecting such investment; and ways to fairly, efficiently, and effectively foster future achievement of the purposes of such investment.

Methodology: The two agencies developed a survey and used it to collect data from the participating electric utilities, the Department of Community, Trade and Economic Development Housing Division (for low-income data), industrial self-generators using renewable resources, the Northwest Power Planning Council and the Northwest Energy Efficiency Alliance. Seventeen utilities completed and returned the surveys, though some did not have all the data available for reporting. The survey focused on investments in conservation, savings achievements, financial support for low-income customers, qualifications for determining low-income eligibility, investments in weatherization, and the amount of electricity generated from renewable resources and sold to Washington customers.

In addition, agency staff held a workshop with stakeholders and researched relevant federal and state statutes, reports on public purpose legislation in the other states, and documents on current trends affecting public purposes.

Summary of Section Nine: This section includes a brief history of policies guiding collective investment in energy efficiency, renewable resources, and low-income services (collectively “electricity system benefits” or “public purposes”). Each of these electricity system benefits is described using a common format:

- a brief summary of important points,
- a discussion of policy goals and statutes driving achievement,
- a discussion of current investment and achievement,
- a description of trends affecting investment and achievement, and
- the industry’s current responses to those trends.

Section 9 includes a brief status report on the way public purposes have been in addressed in states that have adopted retail competition for electricity service, and concludes with a discussion of policy strategies and administrative mechanisms for achieving public purpose goals.

9.1 Introduction

State and federal governments have adopted many policies in support of an electricity system that provides energy service at the lowest total cost and access to affordable energy services for all. These two primary policy goals - minimizing total costs and providing universal access - are the rationale for achieving conservation, renewable resource development and delivery of low-income energy services. Other benefits associated with these purposes may include environmental quality, improved service, more comfortable homes, and more competitive businesses.

However, the policy strategies and mechanisms widely relied on during the 1980s and early 1990s to achieve these purposes have become less effective in today's electricity industry. Achievement of these purposes in the future may require changes to existing strategies and mechanisms.

9.1.2 History/background

As the Northwest developed its hydropower-based electricity system, low-priced supplies became abundant. The Northst was not densely populated, and large hydropower projects created a supply surplus. With ample supplies, low prices, and relatively little concern over the environmental effects of electricity production, efficient use was not a priority.

The seeds of change were planted as Washington grew and developed during the 1960's. With demand growing and choice hydropower sites gone, planners turned to thermal plants, using steam generated by the heat of nuclear fission, coal, and other combustion sources, as new generation resources. Regional utilities began an ambitious program of nuclear and coal plant development to meet projections of rapidly and continuously increasing demand.

The oil embargoes of the 1970's set in motion a number of economic and institutional changes that altered these plans forever. Higher energy prices produced a textbook economic result - lower demand for energy - which in turn called into question the need for new generating facilities. Rising inflation produced much higher capital costs for new plants. Greater environmental awareness and activism was manifested in citizen opposition to siting thermal power plants and passage of the Clean Air Act to address pollution from sources such as electricity generation[1]. Risks associated with reliance on imported energy led lawmakers to value energy independence, which in turn led to legislation that spurred the development of independent power producers. Energy efficiency became recognized as a low-cost source of new supply; kilowatt-hours saved through energy efficiency investments could provide the same energy services as kilowatt-hours generated by new power plants, and often at lower cost. This led to the adoption of "least-cost planning" statutes and rules that required utilities to evenly and systematically evaluate all supply-side and demand-side alternatives for meeting new demand. Conservation became an integral part of the way utilities acquired the resources necessary to meet their supply obligations.

9.1.3 Regional Power Act

Congress passed the Pacific Northwest Electric Power Planning and Conservation Act (the Act) in 1980 and, in doing so, transformed electricity resource planning in the Northwest. The Act created the Pacific Northwest Electric Power and Conservation Planning Council (Council) and directed the Council to prepare and adopt 1) a regional conservation and electric power plan (the Plan) and 2) a program to protect, mitigate, and enhance fish and wildlife. Congress directed the Council's Plan to give priority to electricity resources in the following order: first, to conservation; second, to renewable resources; third, to generating resources utilizing waste heat

or generating resources of high fuel conversion efficiency; and fourth, to all other resources. The Act required the Plan to outline a strategy for implementing conservation measures and developing resources to reduce or meet the federal power system's (BPA's) obligations. It empowered the Council to be a regional resource planner, and directed that the BPA Administrator, "to the maximum extent practicable, make use of his authorities under this Act to acquire conservation measures and renewable resources, to implement conservation measures, and to provide credits and technical and financial assistance for the development and implementation of such resources and measures." [2]

Under the direction of the Act, BPA worked cooperatively with its customers and stakeholders to design and fund energy efficiency research and programs and investigate and fund renewable energy opportunities through the mid-1990s.

9.2 Conservation

Summary: Energy efficiency has strong policy support in federal and Washington state laws. Utility investment in conservation as a power resource has declined significantly from its peak five years ago. Key trends include the advent of competition, a dramatic decrease in BPA funding, a decrease in the avoided cost of power, and a greater focus on market transformation and commercial and industrial programs.

9.2.1 Conservation Policy Goals and Statutory Background

Beginning in the late 1970's and early 1980's, federal and state lawmakers have articulated strong policy support for energy efficiency and conservation. Energy efficiency and conservation are established as policy objectives for public utility districts, municipal utilities, irrigation districts, state and other publicly-owned buildings managed by the Department of General Administration; the Utilities and Transportation Commission; the state building code, the state's clean air and solid waste programs, and the low-income weatherization program. The constitutional ban against lending public credit has been amended three times to provide exceptions for investments in energy efficiency. (See Appendix A for a more complete list of legislative policy related to energy efficiency). In these laws, the legislature has articulated several policy rationales for favoring energy conservation and efficiency:

- To eliminate wasteful and uneconomic uses of energy and materials. [RCW 43.21F.015]
- To use energy efficiently. [RCW 19.27A.015]
- To reduce environmental impacts related to energy consumption, including air pollution. [RCW 70.94.011 and 39.35 RCW]
- To reduce the operating costs of state-run facilities. [39.35 RCW]
- To reduce the risk of energy shortages due to growth. [RCW 80.04.250]
- To provide a reliable supply of energy based on renewable resources. [RCW 80.28.024]

- To provide incentives to public and private utilities to invest in conservation measures. [RCWs 80.28.024, 80.28.025, and 80.28.303]
- To assist owners of structures and equipment in investing in energy conservation [RCW 54.16.280].

Conservation and energy efficiency have also been prominent policies in federal laws over the past 20 years, including the National Energy Act (1978), the Public Utility Regulatory Policies Act (PURPA) (1978), the Pacific Northwest Electric Power Planning and Conservation Act (1980 Public Law 96-051), the National Appliance Energy Conservation Act (1987), and the National Energy Policy Act of 1992 (EPAct).

The Utilities and Transportation Commission adopted a least-cost planning regulation in 1987 (WAC 480-100-251), that requires investor-owned electric utilities to evaluate energy efficiency and supply-side investments on an equivalent basis and to select the lowest-cost way of meeting demand.

Washington's Energy Strategy, prepared in 1992 and adopted by the legislature in 1993, contained many recommendations for delivering system benefits. It recommends:

- All cost effective conservation and efficiency opportunities should be pursued aggressively in both public and private utility markets.
- Improve the ability to evaluate the full range of benefits from renewable energy technologies, e.g. by explicitly considering fuel diversity, resource cost, environmental impact, system reliability, risk of future environmental regulations on energy sources, and exposure to fuel price risk.
- Ensure that low-income weatherization programs address energy savings for the largest number of low-income citizens possible.

The 1996 Comprehensive Review of the Northwest Energy System, convened by the governors of Idaho, Montana, Oregon, and Washington, recommended "that all cost-effective electric efficiency opportunities be captured in a manner consistent with increasingly competitive electricity markets". The Review further recommended that nearly 2% of system revenues (approximately $73 million annually in Washington) be targeted to energy efficiency investments for at least a ten-year period.

9.2.2 Conservation Investment Data

The combined efforts of utilities, the Bonneville Power Administration, consumers and state government in the Pacific Northwest delivered some of the most successful electric conservation and research programs in the country between the late 1970s and early 1990s. The rationale for utilities' active pursuit of conservation stemmed from the fact that, during this period, substantial energy savings could be acquired for less than the cost of new generation or other power supply alternatives. When utilities acquired conservation at a lower cost than these alternatives, the total cost of electricity service was reduced. This rationale still holds. However the costs of new generation and power supply alternatives in the market have declined. Even cost-effective efficiency measures have recently become less attractive to utilities because they reduce electricity sales and may put upward pressure on rates.

Figure 9.1 and Table 9.2 show total investment in conservation programs by utilities responding to data requests for this report. Responding utilities represent 90% of Washington utility sales. Conservation investment peaked in 1993, when utilities reported spending over $155 million, but has declined significantly in recent years to less than one-third this amount. In addition, the share of funds from BPA has fallen from half the total, in 1995, to a projected one-seventh of the total in 1999. Bonneville is restricting its post-1999 budget to funding $15 million in regional market transformation. (BPA is considering a rate discount proposal to stimulate further conservation in the region. See below.)

Figure 9.1 Electric Utility Conservation Expenditure Estimates in Washington

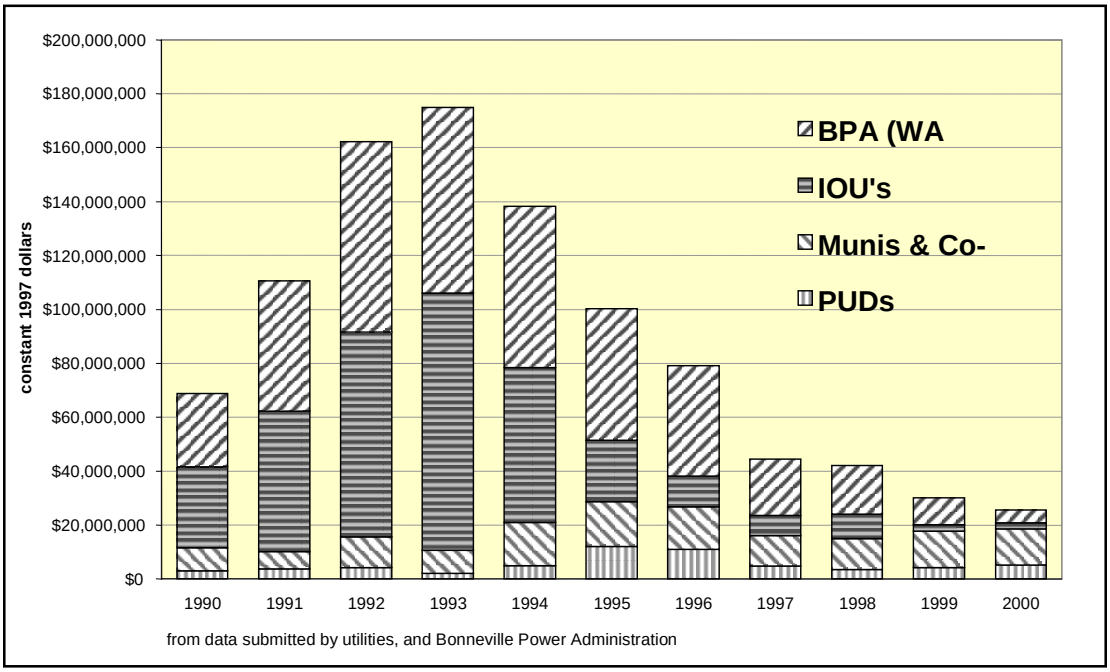


Table 9.2 Total Investments in Conservation (millions of dollars)

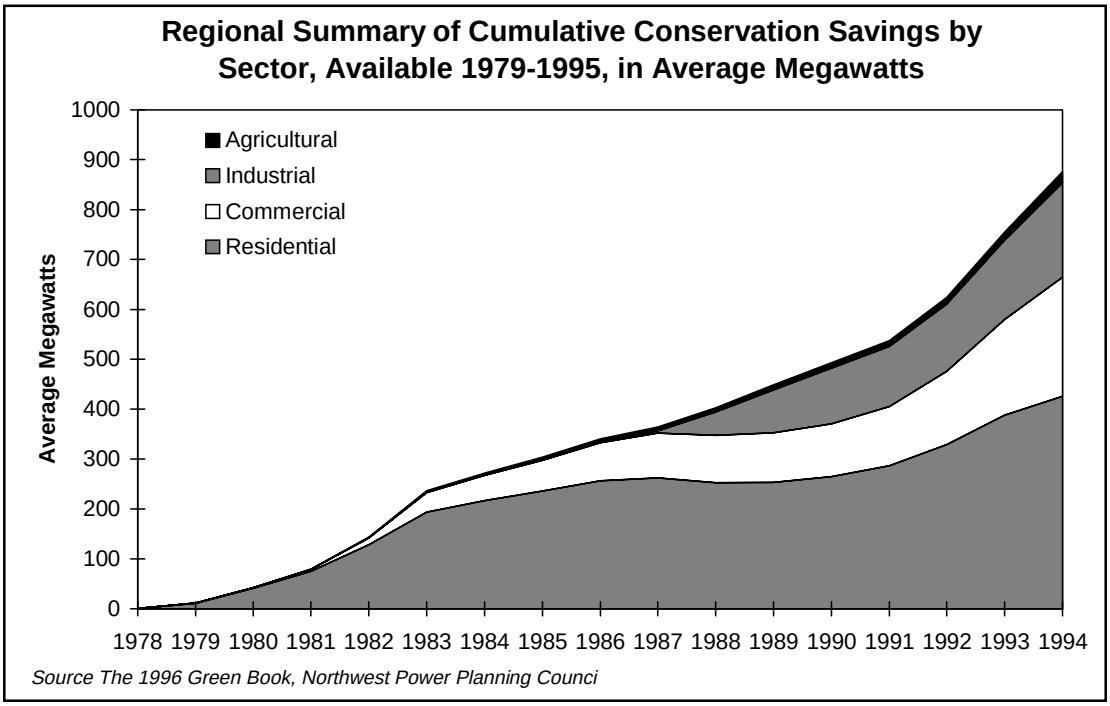
Year	Dollars/year Constant 1997$	Dollars/year Current $	BPA Dollars Current $	Percent from BPA
1990	64.37	54.04	19.21	36%
1991	104.43	90.91	36.72	40%
1992	154.77	138.47	56.6	41%
1993	169.14	155.08	57.82	37%
1994	134.57	126.24	52.66	42%
1995	98.47	94.73	45.2	48%
1996	78.39	77.05	39.54	51%
1997	44.45	44.45	20.86	47%
Est. 1998	42.52	43.58	19	44%
Est. 1999	33.09	34.77	13.7	39%
Est. 2000	24.09	25.94	3.57	14%

Note: Constant dollars adjusted for inflation

9.2.3 Conservation Achievement

According to the 1996 Northwest Power Plan, the region's utilities acquired over 800 average megawatts of cumulative electricity savings from 1979 to 1995. (See Figure 9.3.) New codes and standards (including Washington State energy codes, and new federal commercial heating, ventilating and air conditioning systems and lighting equipment standards) will save about 165 aMW over the next 18 years. Federal standards for clothes washers, dishwashers and showerheads are projected to save the region 140 aMW. New energy efficiency standards for manufactured housing, in combination with the region's Manufactured Housing Acquisition Program (MAP), successfully transformed the energy efficiency of new manufactured homes. As a result, under the Council's medium electricity load forecast, space heating loads for manufactured homes across the Northwest in the year 2015 will be approximately 270 aMW lower than would have been the case without the standards[TE1].

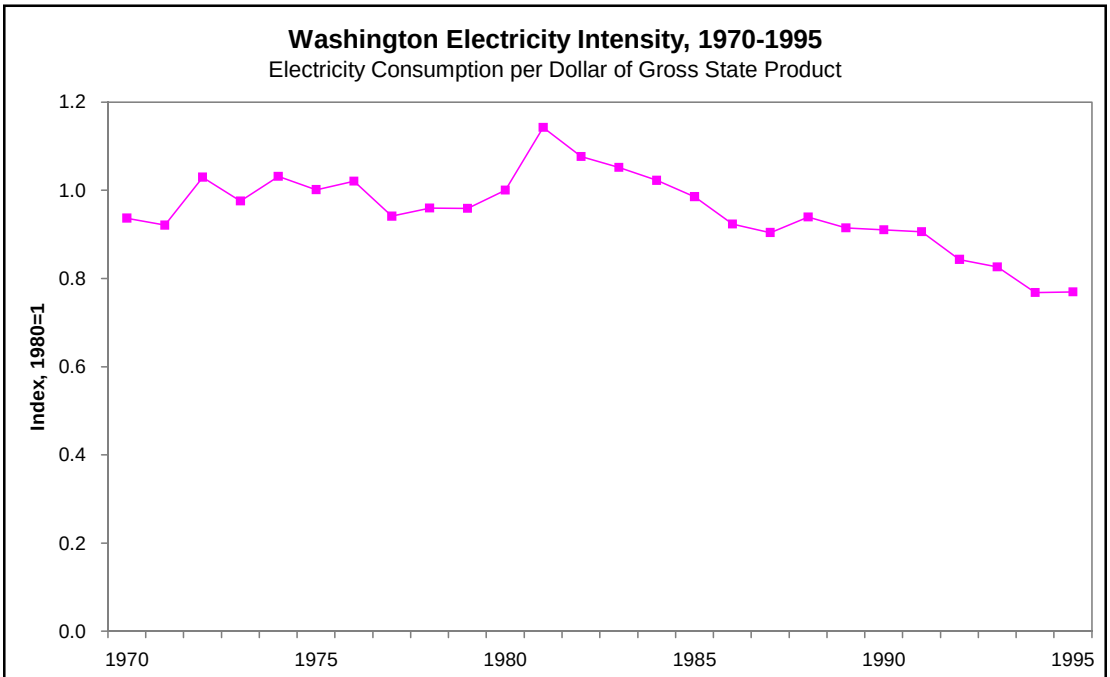
Figure 9.3



Source The 1996 Green Book, Northwest Power Planning Counci

This investment in conservation has produced substantial and continuing benefits in efficiency for Washington homes and businesses. Average Northwest electricity use per residence declined about 13% from the peak year of 1982.[3] Regional per capita electricity use declined 10% between 1990 and 1996.[4] Washington's electricity intensity, defined as electricity consumption per dollar of gross state output, declined 20% between 1985 and 1995. See Figure 9.4. While some of this decline is due to changes in the state's economic base away from electricity intensive industries to service industries, to fuel switching, and to private investment in conservation, a sizeable proportion is due to utility investment.

Figure 9.4



Looking forward, the Council estimates the regional potential for additional cost-effective conservation resources over the next 20 years to be over 1,500 aMW, one-and-one-half times the electricity use of the City of Seattle. This does not include any efficiency potential in the aluminum industry, which the Council has not estimated. About one-third of this available conservation is in non-aluminum industrial facilities. The energy savings potential of other technologies or processes is listed below in Table 9.5. The average levelized cost of these resources is approximately 1.7 cents per kilowatt-hour, roughly two-thirds of the cost of new generating resources. (See Table 9.5.) The Council estimates that market forces alone will only capture about 20 percent of this potential. If the remaining 80 percent is not captured by some combination of utility, public, and private actions, the region is projected to spend approximately $1.8 billion in added electricity expenses over the next 20 years. Nearly half of this cost would fall to Washington electricity consumers.

Table 9.5 Average Achievable Conservation Potential

End Use Sector	Average Megawatts	Average Levelized Cost (Cents/kWh)
Freezers	15	1.9
Refrigerators	45	2.9
Water Heating	335	2.0
Residential Lighting	30	2.6
New Residential Space Heating	140	2.1
Existing Residential Space Heating	25	1.8
New Commercial	230	1.3
Existing Commercial	95	1.4
Commercial Renovation/Remodel	50	1.3
New Non-Aluminum Industrial	225	1.5
Existing Non-Aluminum Industrial	335	1.5
Direct Service Aluminum Industrial	Not Estimated	Not Estimated
Irrigated Agriculture	10	1.8
Total	**1.535**	**1.7**

9.2.3 Trends Affecting Energy Efficiency Investments and Achievement

Growing competitive pressure. While no retail restructuring legislation has been adopted in Washington State, many of the competitive pressures accompanying retail access are affecting Washington utilities. As discussed in Section 2, many of Washington's large customers are already eligible for some form of market-based price. Competitive pressure on utilities naturally leads to a focus on minimizing short-term rates. Utilities may be reluctant to fund conservation that reduces energy sales and revenues, or places upward pressure on their near-term costs, possibly undermining their competitive position.

With active wholesale competition, BPA energy efficiency funding has declined sharply. BPA dramatically scaled back its conservation budget when the price of wholesale electricity dropped and BPA power became subject to price competition. BPA funding has declined steadily since 1993, when its investment in Washington was at least $58 million. BPA indicated in 1995 that it would be more appropriate to fund conservation at the retail level.

Possible future supply and/or capacity deficits. In late summer, 1998, BPA presented a forecast that estimated a 50% chance of monthly supply deficits during peak periods within 5 years. The NWPPC is evaluating BPA's forecast. (See Section 2 and Section 8.) Measures to prevent such a shortfall could include a variety of energy efficiency and load management strategies.

Lower wholesale energy prices. The rationale for utility investment in conservation has rested on the fact that energy savings may represent a cost-effective alternative to new supply resources.Lower wholesale electricity prices mean that fewer

conservation measures may meet standard cost effectiveness tests.

Shift of conservation funding to industrial and commercial programs. In the 1980's, most conservation funds were invested in the residential sector.[5] Survey data indicate that Washington utilities expect to invest three times more in industrial and commercial programs than in residential in 1999. The Council's most recent plan estimates that roughly a third of the region's cost-effective conservation potential is in the industrial sector.[6] These are the customer sectors that are also most interested in competitive retail electricity markets.

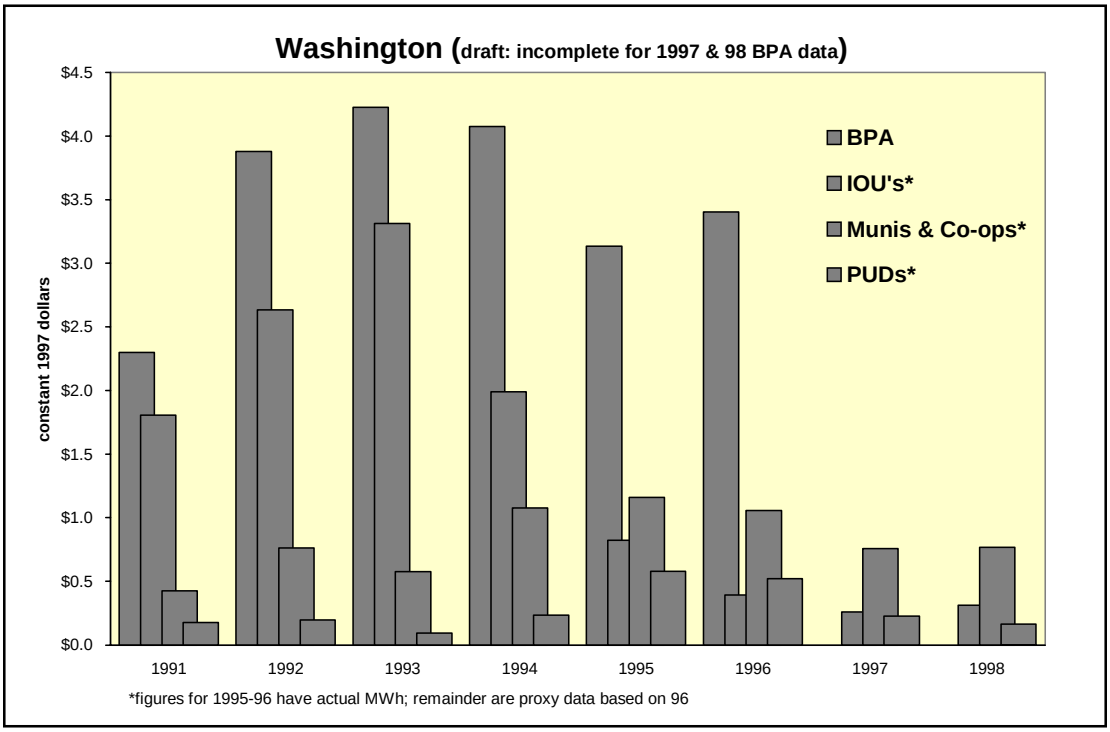
Focus on regional market transformation. Since late 1996, the region's private utilities and BPA have funded a regional non-profit organization - the Northwest Energy Efficiency Alliance (Alliance). The Alliance's Board is composed of Northwest environmental, utility, government and energy service representatives. The Alliance is attempting to transform energy efficiency markets with programs that range from energy efficiency in the microelectronics and food storage industries to resource saving front-loading clothes washers. The Alliance's analysis of its current program mix indicates that its programs are achieving conservation at less than one cent per kWh. The Alliance attributes the low cost of savings to: strategic intervention at high leverage points in the market; implementing programs with non-energy benefits; and securing lasting changes to the market that deliver sustained savings over time.

Performance contracting for commercial and industrial consumers. Large commercial, industrial, and institutional customers are increasingly using performance contracting as a way to invest in energy conservation without putting their capital at risk. Under performance contracting, a contractor provides design, capital, construction, and often maintenance for new energy efficient systems or equipment. Energy savings are shared between the contractor (which uses the savings to pay back the capital investment and to make a profit) and the customer. A big spur to performance contracting was federal Executive Order 12902 (March 1994), which called for a 30% reduction in energy consumption at federal buildings within 10 years. The Departments of Energy and Defense have pre-qualified several contractors so individual agencies can choose from the list without having to conduct their own bidding. Federal facilities in Seattle (NOAA) and Auburn (FAA) are among those conducting energy audits.[7] The Washington Department of General Administration has developed a Statewide Energy Savings Performance Contract for use by cities, counties, school districts, the state and other special-use districts interested in improving the efficiency of their energy and utility systems.[8]

9.2.4 Effect of General Trends on Conservation Investment

Utility investment in energy efficiency is declining rapidly. Electric utilities' response to the trends discussed above has generally been to reduce investment in conservation. Expenditures are expected to drop 83% from their high in 1993 to the projected levels in 2000. (See Figure 9.6) All but one utility reported recent declines in their conservation budgets. The most commonly cited explanations for budget reductions were that:

Figure 9.6 Conservation Spending per MWh Sales



- ❖ BPA has discontinued funding for utility programs. BPA cuts were cited by nine utilities as a primary reason for reducing their conservation budgets.
- ❖ Utilities are shifting toward loan and information programs and away from programs that involve direct payment for conservation measures. These programs rely on consumers to bear most or all the costs of efficiency measures. .This change has typically been accompanied by a shift in emphasis, from programs focused primarily on savings to programs that offer other services. Nine of the ten residential programs that Washington utilities expect to fund from 1998 to 2000 are either loan or information programs.
- ❖ Competitive pressures - utilities are generally trying to minimize near-term rate impacts, decrease costs, and increase revenues.
- ❖ Two utilities indicated that availability of lower-cost power in the wholesale market has affected their conservation investments.
- ❖ Some utilities indicate they have weatherized most of their housing stock.

The status of least cost planning is unclear. Utility investment in conservation over the past two decades has been guided by least cost planning analysis or an integrated resource plan. (WAC 480-100-251 for investor owned utilities; RCW 80.52.080 for public utilities). This analytical process directed utilities to choose the mix of supply and demand side measures that minimize the total cost of service to consumers.

Although investor-owned utilities are directed to prepare least-cost plans biennially, one investor-owned utility is not current with this schedule. The WUTC has recently examined the role of least-cost resource planning and, in its summary of a recent inquiry, stated:

"The Commission believes revisions to the [least-cost planning] rule may be appropriate for the purposes of focusing its application to monopoly utility-supplied services, bundled or unbundled. Consequently, the major emphasis should be on planning for generation and energy efficiency resources and distribution services for loads that continue to be served on a monopoly bundled basis, and only on distribution services for those loads to be served on an unbundled basis. Additionally, such planning should focus on maintaining reliability of the distribution network." [WUTC. Notice of Termination of Inquiry, April 22, 1998]

We do not know whether and to what extent consumer-owned utilities, such as municipalities or public utility districts, are still performing least cost planning analysis. With growing competition and an active wholesale power market, it is increasingly difficult for utilities to conduct a meaningful analysis of future customer load. As competitive pressures mount, and with considerable uncertainty about their responsibilities, many utilities are unwilling to plan as if they will be the sole supplier for their traditional customers. Finally, declining wholesale power prices means there are fewer conservation measures that are cost-effective.

New funding mechanism for conservation. Prior to 1995, most utilities in the country capitalized the bulk of their conservation costs and recovered those costs in bundled rates. In 1995, Washington Water Power became the first utility in the nation to begin funding its programs through a non-bypassable distribution charge - the Energy Efficiency Tariff Rider. This approach - a type of systems benefit charge to finance conservation programs - enables the utility to collect all the funds necessary to operate efficiency programs in the same year that they spend the funds, and thereby removes the need for the utility to finance the investments. Other companies (including Puget Sound Energy) and state legislatures across the country have since adopted similar funding mechanisms. The tariff rider has been considered as a possible funding mechanism for public purposes in the future as the industry moves to a more competitive environment (see Strategies section, below).

Declining research and development funds. In order to leverage consumer investments in energy efficient products and processes, program designers rely heavily on research about market infrastructure, consumer preferences, and the capability and reliability of new products. Funding for efficiency-related market and technical research has dropped dramatically in the Northwest and across the country. Such research has, in the past, provided technical, cost, and market data that formed a foundation for many conservation programs, including energy efficient industrial motors; resource efficient clothes washers; commercial and residential energy codes; and energy-efficient manufactured homes. BPA was a regional leader in designing and funding energy efficiency research in the past, often bringing in private and industry partners. BPA recently eliminated this function. Nationally, the

US General Accounting Office reported that utility investments in electricity R&D decreased by 33 percent between 1993 and 1996.9

9.2.5 Recent Developments

BPA subscription incentive proposal. In September 1998 as part of its power subscription process, BPA proposed a rate discount on firm power sales to customers who invest, and achieve results, in conservation, renewable resources and low-income weatherization. The actual mechanism and the magnitude of investment and achievement that it would secure are under discussion.

Regional Technical Forum. In 1996, Congress directed BPA and the NWPPC to convene a Regional Technical Forum to develop standardized protocols to verify and evaluate conservation savings, track regional progress toward achieving conservation and renewable resource goals, and recommend ways of improving the effectiveness of programs and activities in the region.

In July 1998, the NWPPC issued a proposal to initiate the Regional Technical Forum. The Council proposes that it perform the functions of the Regional Technical Forum with the assistance of a standing advisory committee to ensure broad technical and policy input. The Regional Technical Forum's roles, responsibilities and guiding policy structure are still evolving.

9.3 Renewable Energy

Summary: Renewable energy sources can reduce air emissions, offer less fuel price risk, and provide non-power benefits (e.g. by facilitating waste disposal). Globally, renewable power generation is a growth industry with a declining cost curve. Less than one percent of electricity sales to Washington consumers are generated with non-hydro renewable resources. However, several of the nation's leading renewable energy manufacturers are located in Washington.

9.3.1 Background

Definitions. ESSB 6560 defines renewable resources as: ?electricity generation facilities fueled by: (a) water; (b) wind; (c) solar energy; (d) geothermal energy; (e) landfill gas; or (f) biomass energy based on solid organic fuels from wood, forest, or field residues, or dedicated energy crops that do not include wood pieces that have been treated with chemical preservatives such as creosote, pentachlorophenol, or copper-chrome-arsenic. Only non-hydro renewable resources are included in the language authorizing this study (Section 5(1)(g)).

Wind energy can be produced anywhere the wind blows with consistent force. The windier the location, the more energy can be produced, and the lower the cost. Wind is an intermittent resource. The ease with which wind can be integrated into the grid and the economic feasibility of wind depend in part on the match between wind availability and patterns of consumer demand. Sites with significant wind energy resources in Washington state are located along the Pacific Ocean coast, the Columbia River corridor bordering Oregon, and the Ellensburg area in Central

Washington.[10]

Solar radiation is used to produce electricity in two ways: photovoltaic (PV) systems and solar thermal systems. PV systems change sunlight directly into electricity, and are most commonly used in remote areas where line extensions are costly. However, grid-integrated systems are becoming more common[11]. Solar thermal systems can either be direct applications, such as solar hot water systems, or can generate electricity by using solar energy to heat a fluid that produces steam used to turn a turbine and generator.

Geothermal energy is generated by bringing hot water or steam from subterranean cavities to the earth's surface and using it to spin a generator. Geothermal generation requires ground water at temperatures at or above 300o F., in fractured or otherwise highly porous rock, at depths less than 10,000 feet. Washington has modest possibilities for geothermal power generation along Cascade range volcanoes, particularly Mounts Baker, Adams, Rainier, and St. Helens. Geothermal heat can also be used in heat pumps and district heating systems.

Biomass fuels are any organic matter that is available on a renewable basis. ESSB 6560 limits this definition to include only wood, forest or agricultural field residues, or dedicated energy crops that do not include wood pieces that have been treated with chemical preservatives. Biomass can be burned in an incinerator to produce energy.

Biomass - landfill gas and sewage treatment. The legislative definition does not identify landfill gas or use of sewage treatment methane as a biomass. However, energy scientists generally categorize both of these as biomass. Anaerobic decay of organic materials, such as in a landfill or sewage treatment plant, produces a gas with high concentrations of methane. Once collected, this gas can either be cleaned to pipeline quality, used to fuel engine-generator sets or small combustion-turbine power plants, used in fuel cells, or sold for use as a boiler fuel.[12]

Fuel cells generate electricity through chemical processes rather than combustion. Most rely on hydrogen for a fuel source. Although they are not included in traditional definitions of renewable resources, fuel cells are an emerging technology may be an important partner with renewable resources in delivering distributed energy and serving off-grid systems in the future. Unlike biomass plants, fuel cells do not emit traditional pollutants, such as nitrous oxide and carbon monoxide into the air. However, the reforming process that extracts hydrogen from a fossil fuel for use in a fuel cell emits carbon dioxide, a contributor to global warming.

9.3.2 Renewable Policy Goals and Statutory Background

The Legislature has enacted a number of laws to promote the use of wind, geothermal, and small-scale renewable energy. (See Appendix.) RCW 80.28.025 finds that actions and incentives by state government to encourage the use of renewable resources will be of benefit to the citizens of the state. Meeting energy needs with renewable energy can prevent environmental damage, assist the state in diversify-

ing its energy resources, reduce transmission and distribution costs in remote areas, reduce exposure to fuel price risk and reduce health problems related to air pollution.

Climate Change and Air Quality.[13] Renewable generation sources emit little or no carbon dioxide, the largest contributor to global warming. (See section 2.) Wind and solar energy have no atmospheric emissions and contribute no greenhouse gases to the atmosphere. Geothermal plants generally produce substantially less emissions than fossil fuel combustion. Biomass combustion releases more pollution than natural gas for generating an equivalent amount of power, but controlled burning of biomass residues for power generation is less polluting than the uncontrolled burning that might otherwise occur.[14] To the extent that renewables contribute to emission reductions, they may improve public health and provide economic benefits due to reduced medical expenditures

Risk reduction. A diverse resource portfolio that includes renewable resources reduces exposure to fuel price, technology and environmental risks and uncertainties.

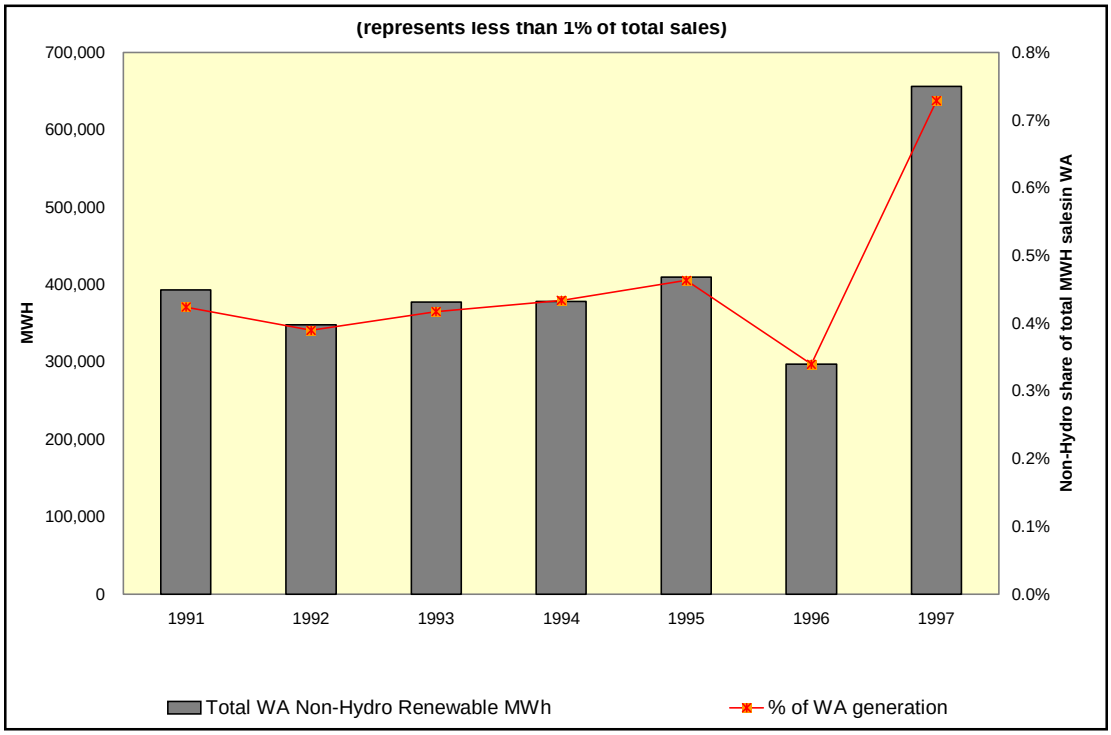
System efficiency improvement. Renewables such as photovoltaics and fuel cells may offer utilities opportunities to improve the overall efficiencies of their systems. As discussed earlier in this study, about 40% of the cost of providing electricity to a residential consumer is attributable to transmission and distribution. Providing electricity to remote areas can be quite expensive. Distributed resources could be less expensive than some long line extensions, and could also offer reliability benefits.

9.3.3 Current Renewable Resource Initiatives

Non-hydro renewable resources generate less than one percent of the electricity consumed in the state. Nine of 17 utilities that provided information for this report supply some form of renewable power or are considering doing so in the near future. As shown in Figure 9.41, non-hydro renewable resource use increased significantly in 1997, with biomass as the most utilized source. Landfill or sewage treatment gas recovery offers non-power benefits by facilitating waste disposal and reducing methane gas that would otherwise be released to the atmosphere. (Methane is a much more potent contributor to global warming than carbon dioxide.)

A report prepared for CTED in September of 1998 identified 134 firms involved in various sectors of the renewable energy industry in Washington. The estimated revenues for 1997 totaled $147 million, and the companies employed about 900 workers.15 Nearly half of this activity is due to the solar energy industry in the state. While only about 2 percent of U.S. electric sales are currently derived from non-hydro renewables sources, renewable energy use world-wide is growing relatively rapidly.

Figure 9.7 Non-Hydro Renewables in Washington



Wood and paper waste biomass Until 1995, wood and paper waste biomass represented more than 90 percent of the total non-hydro renewable power generated in the state. However, they have dropped to less than half the total due to an increase in production from other sources (particularly landfill gas) and the closure of three paper and pulp mills.16 WWP is the main supplier of biomass-generated electricity, with power generated by the Kettle Falls plant, and purchased from two co-generation projects - Wood Power, Inc. and Rayonnier. (However, the latter plant burned down in July 1998). In addition, at least four non-utility generators meet on-site power needs with energy from wood residues generated by their own industrial operations. It is not clear if all the production from these mills would meet the renewable definition provided in the legislation.

Landfill gas. Power generation from landfill gas has become the second largest source of non-hydro renewable electricity in the state and may surpass wood waste biomass by the end of 1998. Benton REA is one of twelve rural cooperatives in Idaho, Oregon, and Washington that have developed the Coffin Butte Resource Project located in Oregon, a landfill gas-to-energy plant. Tacoma Power and WWP began supplying power from landfill gas in 1998. Klickitat County PUD and Rabanco, the Bellevue-based solid waste firm, are developing a project to generate electricity using methane from Rabanco's Eastern Washington landfill near Roosevelt.

Wastewater. Ninety-five percent of the state's power generated from wastewater treatment is supplied by Seattle City Light from a King County sewage treatment plant at West Point. The LOTT Wastewater Treatment Plant in Olympia uses power from methane to operate the plant.

Wind. Florida Power and Light is building a merchant wind plant, Vansickle Ridge, between Walla Walla and Umatilla. PacifiCorp and BPA are the major partners in a 41.4 MW wind facility under construction in Wyoming.

Geothermal. In 1998, geothermal energy is expected to provide less than 2 percent of the non-hydro renewable power in the state. BPA has signed MOUs signifying its intent to purchase output from two new geothermal facilities (29.7 aMW each) in Northern California. PacifiCorp has included the output of the Blundell Project in Utah in its resource mix since 1991.

Solar. Between 1,000 and 2,000 PV systems have been installed in the state, mainly in the San Juan Islands and Northeastern Washington. The Conservation and Renewable Energy System (CARES), a joint operating agency composed of the Benton, Clallam, Franklin, Grays Harbor, Klickitat, Okanogan, Pacific, and Skamania PUDs, is facilitating utility participation in the federal Million Rooftops Program. The Coulee Dam Federal Credit Union provides favorable loan rates for PV systems.[17]

9.3.4 Trends affecting investments in renewables

Declining wholesale electricity prices. *In general, the declining cost of power has made it more difficult for renewable resources to compete on price, notwithstanding significant declines in the cost of renewable technologies. Competitive pressures may increase the financial risks associated with investments in resources with longer payback horizons or desirable environmental characteristics.*

Restructuring legislation providing for renewables. Several states have adopted restructuring legislation that assures the development of renewable resources, through portfolio standards or buying down the incremental price of renewables.

Growth in overseas markets. In the next 20 years, energy use in the developing world is estimated to increase dramatically. Regions that do not already have a power grid are considered good markets for distributed renewables. Growth in overseas markets may allow for production scale economies that would decrease prices.

Global warming. The Intergovernmental Panel on Climate Change maintains that human activities (primarily carbon dioxide emissions) have contributed to global warming, finding that “the balance of evidence suggests a discernible human influence on global climate.”[18] Global efforts to decrease carbon dioxide emissions may put a premium on development of cost-effective renewable technologies.

Decrease in public research funds. Federal funding for renewable energy R&D declined throughout in the 1980s, and still constitutes only a small percentage of total federal funding for energy supply R&D. (See Section 2.)

9.3.5 Effect of General Trends on Renewable Resource Development

Washington wind project cancelled. BPA, through the Resource Supply Expansion Program (RSEP), developed a wind power strategy to help utilities develop small-scale wind demonstration projects. In September 1992, BPA issued a Request for Proposals for a Wind Demonstration Project to implement the RSEP. In response, the CARES PUD consortium proposed the Columbia Wind Farm #1 Project. However, progress on this project stopped in September 1998 when CARES and the site owner (Goldendale Aluminum) could not reach final agreement.

"Green marketing" programs. In increasingly competitive generation markets, some suppliers are marketing the environmental benefits of renewables as a potential source of competitive advantage and product differentiation. To the extent that premium revenues from "green marketing" are used for new renewable resources, green marketing may result in increased investment in renewables.

Disclosure and Labeling. At least 27 states are considering or have adopted disclosure standards. Some of these states are not actively pursuing retail competition. These standards generally require disclosure of fuel mix and resource emissions. Consumer research conducted for the National Council on Competition and the Electric Industry indicates that electricity consumers seek information on the environmental characteristics of energy resources in a simple, uniform format similar to food labels.[19]

Representatives of the WUTC and 11 other states and British Columbia are participating in the Western Disclosure and Tracking Project to develop a mechanism to track electricity generation attributes from the source to the consumer. Under the Project's proposal a neutral third party or clearinghouse would issue certificates to electricity generators based on the characteristics of their generation. Retail electric service providers would need to possess certificates to justify any claims they make about their product. (See Legislative Study 2831 on Disclosure for greater detail.)

9.3.6 Barriers to Renewable Energy Development

The largest barrier to increased use of renewable energy is price. Renewables are typically higher in both total price and up-front capital costs than natural-gas fired combustion turbines. The lower environmental cost of renewables is generally not fully captured in prices, since many of the environmental costs of conventional resources remain external to price.[20]

Financing renewables may be difficult. Wall Street is taking a conservative stance on merchant power plant investment of all fuel types. Renewables may be harder to finance than fossil fueled resources for several reasons:

- Obtaining long-term purchase agreements from residential customers will be difficult given consumer mobility and high transaction costs. Lack of long-term contracts increases risk to investors.

- ❖ Gas-fired plants are less capital intensive than renewables. Capital costs can be paid off in as little as six years, while the fixed costs of renewable plants usually require at least ten years to pay back.
- ❖ Fossil-fuel suppliers have new tools to maintain their market share by reducing risks to electricity generators (for example reverse tolling, in which fossil fuels are sold in fuel markets instead of converted to electricity when fuel prices are high). These tools are generally unavailable to renewable energy projects, which do not have control over the price or location of wind, solar, biomass, and geothermal "fuels".[21]

As with any energy project, renewable generation can face site-specific opposition. For instance, even though the environmental community generally supports renewable energy, the cancelled CARES Washington Wind project, mentioned above, was opposed by an environmental group concerned about potential impacts on wildlife.[22]

9.4 Low Income Energy Services

Summary

Low-income energy services take two primary forms: assistance to reduce or pay energy bills, and increasing the efficiency of energy use, primarily through weatherization. Federal assistance for these functions has decreased more than 20% since the early 1990s. BPA plans to discontinue funding for weatherization assistance after 1998. Many (though not all) consumer-owned utilities offer rate discounts to low income seniors, with a total annual value of $5 million in 1997. Although many homes have been weatherized, and a few utilities report a saturated market for weatherization, there is growing need for low income energy services: the percent of Washington's population earning below the federal poverty level increased significantly this decade.

9.4.1 Policy Goals and Statutory Background

Many federal, state, utility and charitable low-income service programs are based on the premise that affordable energy service should be available to all consumers. The legislature has found that it is in the state's interest to: preserve affordable natural gas and electric services to the residents of the state; maintain and advance the efficiency and availability of natural gas and electric services to the residents of the state; ensure that customers pay only reasonable charges for natural gas and electric service; and to permit flexible pricing of natural gas and electric services. (RCW 80.28.074)

In 1987, the Legislature found that weatherization of low-income residences will:

reduce energy consumption, making space heat more affordable for persons in low-income households;
reduce uncollectable accounts of energy suppliers resulting from low-income customers not being able to pay fuel bills; and
help conserve energy resources, reducing the need to obtain energy from more

costly conventional energy resources. (RCW 70.164.010)
Weatherization achieves multiple objectives, not all related to energy. A 1994 evaluation of Washington's weatherization program found that it, "has concrete positive consequences for housing, neighborhoods, jobs, the environment, the payment of utility bills and the economic well-being, health, and safety of the low-income people it serves."[23] When weatherization improves homes, it creates safer living conditions for families, contributes to the scarce stock of affordable housing, extends the life and increases the value of homes, and reduces arrearage to utilities, which lowers the carrying cost of bad debts.[24]

Compared to the average consumer, energy costs represent a higher proportion of a low-income family's budget. In 1995, the average U.S. low-income household spent 9.3% of their household income on energy, compared to 3.1% of the average household's energy expenditure. Electric heating expenses were 2.3% of the typical low-income household's income, but only 0.7% of the average household's income.[25] Low-income households are likely to have small children (50% of the households in low-income weatherization programs had children under 6 years old) or be seniors (25% of the weatherization households had seniors over 60 years old).

9.4.2 Program descriptions - Low-income service programs include: grants to help pay heating bills; weatherizing low income households, rate discounts, charitable contributions, and various "safety-net" provisions.

9.4.2.1 Low-income home energy assistance program (LIHEAP) provides grants to low income customers to help pay heating bills.

LIHEAP consists of two programs: the Energy Assistance Program (EAP), which pays regular grants, and the Energy Crisis Intervention Program (ECIP) which provides emergency payments to low income ratepayers under threat of immanent disconnection.

CTED receives LIHEAP funds from the federal government, and then contracts with local governments and non-profits (generically known as Community Action Programs, or CAPs) to deliver energy assistance services to client households. The local CAP agency screens clients and then provides a level of grant funding based on criteria that include income and climate. If program funding for a given fiscal year is exhausted, there is no obligation by the state or CAP to continue to provide funds. Funds often run out in the early part of the winter.[26]

Households earning 125% of the poverty level are eligible to receive funds. This qualifies a household of three earning $17,063 or less per year. CTED has estimated that there are approximately 275,000 households in Washington that meet the income criteria for LIHEAP assistance. In 1990 CTED assisted 96,000 households with energy assistance, or about one-third of the eligible population. The average payment was $185, enough to pay about one-third of the annual heating bill.

9.4.2.2 Low income weatherization.

In addition to the bill assistance programs, CTED administers two weatherization programs: the Weatherization Assistance Program and Energy Matchmakers.

Weatherization Assistance Program funds come from the federal Department of Energy as part of LIHEAP funding: Congress allows 15% of LIHEAP funds to be used for weatherization. Another initial funding source was oil company payments received pursuant to a lawsuit alleging overcharges during the 1970's energy crises. (RCW 70.164.030).

The Energy Matchmakers program leverages funds by requiring a match from program sponsors. Matches may be in-kind expenditures such as labor and materials. (RCW 70.164.040). Other funding sources include utilities, BPA, US Department of Health and Human Services, US Department of Energy, state capital funds, participating property owners, community action agencies, and block grants. In 1995-97, almost $10 million in funding was proposed for matching funds.

The program administrator, CTED's Housing Division, solicits proposals from sponsors (often utilities) who provide matching funds. Program measures are actually installed by CAP agencies. Weatherization measures include diagnostic air sealing, attic, wall and floor insulation, and heating system efficiencies. The program also provides energy conservation education, measures to mitigate health and safety hazards (such as carbon monoxide poisoning and other air quality dangers), and emergency repairs to protect the weatherization measures.[27]

9.4.2.3 Rate discounts.

Several PUDs and municipal utilities offer rate discounts for eligible customers. Most of the utilities that offer rate discounts indicated that they offer them to senior and disabled low-income customers, while one municipality offers a 50 percent rate discount to all low income customers. One public utility extended their rate discount to all low-income customers as the result of ESSB 6560.

9.4.2.4 Percent of income approach.

Clark PUD initiated a program in 1988 that caps utility bills at 9 percent of a qualifying family's income. Customers agree to pay this amount as a minimum each month while the utility absorbs any past-due amounts and utility charges above this amount. An educational counselor performs a walk-through audit of participant's homes and provides tips on reducing energy bills and home weatherization. This program has reduced Clark's total costs and leveraged higher payments from some low-income consumers.[28]

9.4.2.5 Charitable contributions and other programs.

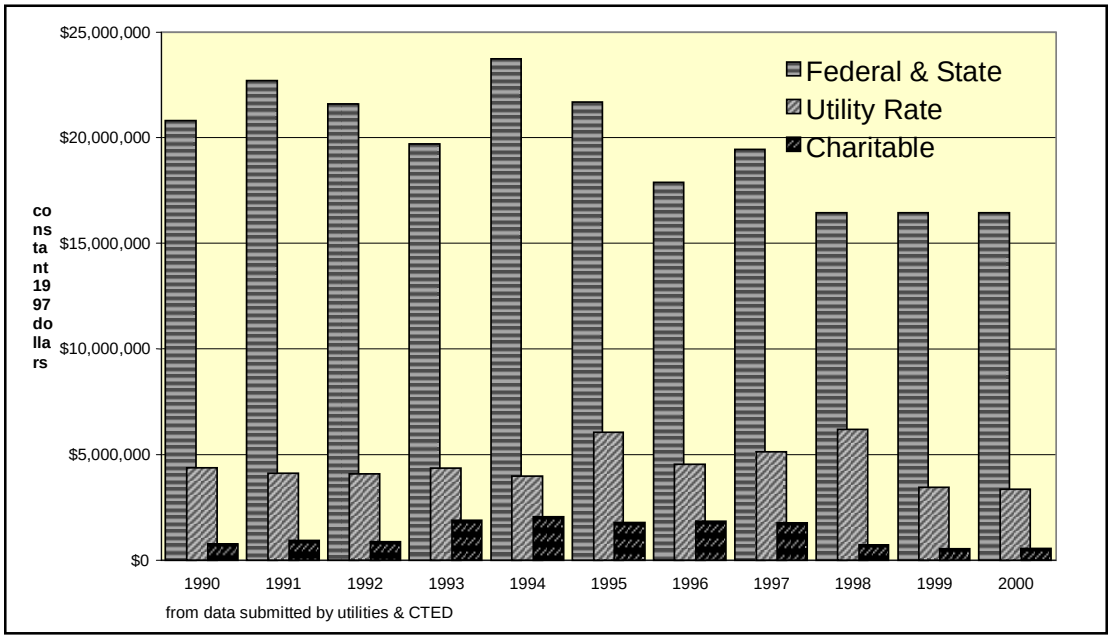
Many utilities allow ratepayers to contribute to low-income bill assistance through their utility bills. Other safety-net type programs include RCW 80.28.010 which provides a moratorium on winter electric disconnections for low-income customers of investor-owned utilities; RCW 54.16.285 limits public utilities' ability to terminate

utility service for residential heating between mid-November and mid-March. (Low-income customers must meet five to avoid having heating service terminated.) These statutes also require utilities to offer budget payment plans to consumers. In addition, WAC 480-100-071 addresses disconnection procedures and requirements for investor-owned utilities.

9.4.3 Expenditures on low-income services

The amount spent on bill assistance by different organizations is shown below in figure 9.8. The amount spent on weatherization is shown in Figure 9.9. Federal LIHEAP block grants for Washington State are $19.964 million in FY 1998 and $21.96 million in FY 1999.[29]

Figure 9.8 Low-Income Bill Assistance Expenditures in Washington



From 1988 to 1995, Energy Matchmakers leveraged $33.5 million for low-income weatherization. Over two-thirds of these funds came from electric utilities or BPA: 48% from retail utilities, 21% from BPA, 14% from rental owners, 9% from gas utilities, and 8% from other funding sources.[30]

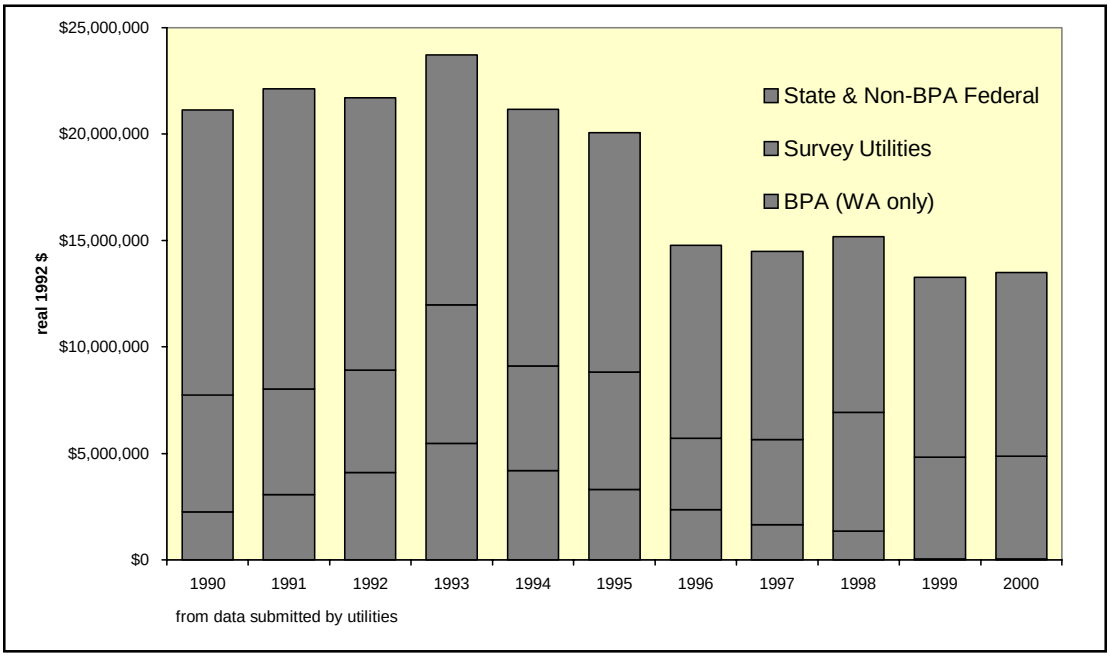
The average low-income weatherization expenditure is $2,600 per home. This means that over 3,560 low income homes can be weatherized per year at current funding levels with state and federal funds. CTED has estimated that as many as 160,000 low income housing units need weatherization.

Utilities reported that low-income rate discounts were valued at $5 million in 1997. Ratepayers contributed nearly another $2 million a year in charitable contributions for each of the past four years.

9.4.4 Trends affecting delivery of low income energy services

Need is increasing - From 1990 to 1995, the percentage of Washington's population below the poverty level increased by nearly forty percent, rising from 8.9% to 12.5%. In the same period, Washington's median income declined in real terms, from $37,444 to $35,568.[31]

Figure 9.9 Low-Income Weatherization Expenditures in Washington



Low income funding is unstable. Low-income funds are subject to fluctuation from year to year. Nationally, LIHEAP appropriations fell from $2.078 billion in 1985 to $1.45 billion in 1994. In 1996, energy assistance funds in Washington fell to the decade's lowest, $12.8 million, 23% below the 6 year-average of $15.75 million.[32] BPA is projecting no funding after 1999. From 1988 to 1995, BPA funds represented 21% of the Energy Matchmaker budget. Congress regularly debates whether weatherization assistance should be an allowed use for LIHEAP funds, and fluctuations in LIHEAP funding affect the amount available for weatherization .

Utilities are increasing low-income discounts. Several utilities that offer low-income rate discounts reported increasing the amount of the discount in recent years. Answers to data requests for this report indicate that the annual value of rate discounts increased from about $3.5 million in 1994-96 to $5 million in 1997, to an estimated $6.3 million in 1998. Most utilities that offer rate discounts offer them to low-income senior citizens. At least two utilities provide rate discounts to all low income consumers; one initiated this practice in 1998 after passage of ESSB 6560.

Drop in wholesale energy prices. Utilities that funded low-income weatherization strictly as a resource acquisition program found that weatherization had difficulty passing their cost-effectiveness tests.

Assistance does not cover need. Under the current system, energy assistance aid runs out early, so many eligible households may not be served. Aid is distributed on a first-come, first-served basis, not targeted to the greatest need.

Saturated weatherization markets. Three utilities indicate that their budgets for weatherization have decreased because there is less consumer demand for weatherization. One large public utility reports that they have now weatherized 80 percent of the 1-4 unit homes they serve. In addition, they expect to reach 80 percent penetration of large, multi-family units by 2001.

9.5 Approaches to Electricity System Benefits in Other States

As of summer 1998, 13 states had passed restructuring laws; regulatory commissioners in four more states had issued restructuring orders; and eight additional states either had regional plans or pending legislation. Seventeen of the 25 states were actively addressing electric system benefit programs.[33] The following summarizes where those states are focusing their system benefit investments.

Research and Demonstration: Fourteen states are addressing the need for public benefit research and demonstration projects that focus on renewables, energy efficiency and environmental quality.

Energy Efficiency: Eighteen of the 25 states have developed provisions for supporting energy efficiency and another four are still studying this. Most programs have been designed to maintain historic investment levels and are typically funded by a nonbypassable system benefit charge.

Renewable Energy: Sixteen of the states provide funding or created portfolio standards to support renewable energy.

Low Income: Sixteen of the states are considering or have legislated a system benefit charge to continue low-income support. Another two have made restructuring provisions for low income.

Disclosure: Thirteen of the states active in restructuring are requiring fuel and environmental disclosure. Another 12 are considering mandatory disclosure policies. Additionally, several states that are not engaged in restructuring discussions are developing disclosure policies.

9.5.1 System Benefits Strategies and Administration in States with Retail Competition

Eleven of the thirteen states with retail competition have identified mechanisms for funding their system benefits programs. All of them are utilizing electric system revenues to collect their funds. The mechanism adopted by ten of these states is the system benefit charge - a competitively neutral, non-bypassable charge. One state has the cost of these programs embedded in rates. Seven states have also adopted renewable resource portfolio standards.

Ten of these 13 states with retail competition have developed or implemented administrative mechanisms for achieving system benefits. Of these ten, eight have clearly identified an independent administrator for renewable resource programs. The administrator is an executive agency, a statewide board, a non-profit or a quasi-public organization.

Approaches for energy efficiency and low-income services are more varied. Several states direct utilities to administer low-income or efficiency programs with oversight from the regulatory commission or an executive agency. Executive agencies or non-profit independent administrators administer the energy efficiency and low-income investments in other states. Several have directed administrators to include competitive bidding processes to allocate some funds for renewable resource development or energy efficiency programs.

9.6 Strategies to Achieve Conservation, Renewable Resources and Low Income Energy Services

9.6.1 Overview

This part of the report describes ways that Washington might continue to achieve energy efficiency, encourage development of renewable resources, and deliver low-income services (collectively, "electric system benefits" or "public purposes") in light of changes in the electricity industry described in this report.

- ❖ The Strategy section begins with a background discussion of the roles of private and public investment in delivering these benefits (9.6.2).
- ❖ Subsection 9.6.3 describes potential criteria for delivering electric system benefits "fairly, efficiently, and effectively," as intended by ESSB 6560.
- ❖ Subsection 9.6.4 examines public investment in electric system benefits funded by a System Benefits Charge. It also describes potential applications for the revenues collected from such a charge.
- ❖ 9.6.5 examines the principal alternative to a SBC for public investment in electric system benefits - tax revenues and incentives.
- ❖ 9.6.6 examines alternatives for administration of public investments in electric system benefits.
- ❖ 9.6.7 examines other policy strategies for encouraging delivery of electric system benefits that may require little or no public investment.
- ❖ 9.6.8 describes alternatives for coordination and assessment of efforts to deliver electric system benefits.

9.6.2 Background - Private and public investment in electric system benefits

Historically, energy efficiency, renewable resources, and low-income services have been accomplished with a mixture of public and private investment. Over the last two decades in particular, a substantial amount of public investment for these purposes was collected from energy service revenues and administered primarily by

electric utilities. The primary alternative form of public investment is through tax revenue or tax incentives.

Consumers acting in their own self-interest sometimes make investments in energy efficiency or renewable resources. For example, some consumers will voluntarily pay more initially for energy efficient lighting. Generally, they are willing to make such investments either in anticipation of future savings on their electricity bills or because they believe that efficient lighting is more environmentally sound. However, in many cases, consumers acting in their own interest will not choose energy-efficient alternatives, even when the additional cost of these alternatives is more than repaid in the form of energy savings over time. This is sometimes called the "energy efficiency gap" - the difference between the energy efficiency of products that consumers purchase and the cost-effective levels of energy efficiency that are available for those products.[34]

Similarly, consumers and utilities may not choose renewable resource alternatives, even when the total (internal plus external) costs of those resources are less than fossil-fueled resources. Where private incentives are not sufficient to capture all cost-effective energy savings and renewable resources, public investment or other public policies may be needed. Some of the most widely documented reasons why private incentives may be insufficient to capture cost-effective energy efficiency and renewable resources include:

"Split incentives" Often, the person who pays for a piece of energy-consuming equipment is not the same person who pays the energy bill. For instance, landlords often purchase appliances while tenants pay the bill. As a result, the landlord may have little incentive to choose an energy-efficient appliance, since the landlord would pay the initial cost while the tenant would reap the benefit in the form of energy savings. Another example is state government, where capital budgets and operating budgets are generally separate. This makes it difficult to finance cost-effective energy efficiency measures from a capital budget that result in savings on the operating side.

- *The "payback gap"* Utilities costs of investment in new power plants historically has been recovered over periods of twenty years or more. Substantial up-front investments in power-generating capability require access to financing and long payback horizons. In contrast, the implicit payback period for consumer investment in energy-consuming equipment is much shorter - generally less than three years[35]. That is, consumers will generally not choose energy-efficient equipment unless the additional cost of that equipment is paid back in energy savings within three years or less. The result is that power plants with payback periods over twenty years may be chosen over energy-saving equipment with payback periods of less than 10 years. Consumers routinely forego energy efficiency investments that would have earned a rate of return 2-3 times higher than the prevailing market rates.[36]

- *Transaction and information costs.* The energy consumption characteristics of power-using equipment are often not apparent to the consumer. The costs of gathering information, locating energy efficient products and putting them into service can discourage investment.
- *Externalities.* Not all of the costs of energy resources are borne by energy consumers. For example, health impacts due to air emissions from fossil-fueled resources may be borne by citizens who are not served by those resources. As a result, consumers and utilities may not choose renewable resources with relatively high internal costs (price) but relatively low total costs (price plus environmental impacts). Utilities and consumers facing competitive pressure may be particularly unwilling or unable to pay a higher price for resources with lower external costs.
- *"Public goods"* Closely related to externalities is the "public goods" problem. When a consumer spends more to purchase a product that reduces environmental impacts, they reap only a small fraction of the benefits. Most of the benefit accrues to the public at large. Since the environmental benefits of energy efficiency and renewable resources are what economists call "public goods," consumer purchasing decisions may not capture those benefits. This is the same rationale that justifies public investment in other public goods such as roads.

As a result of these and other market barriers, private investment will generally capture only a portion of the total potential energy savings and renewable resources that are cost-effective to society. For example, the Northwest Power Planning Council's 1996 Plan estimates that 1,535 aMW of cost-effective electric power savings are available over the next two decades but only about 20 percent of these savings will be captured through private investment alone.[37]

The discussion above describes why private incentives and market forces are sometimes insufficient to secure investments in energy efficiency and renewable resources, even when those investments minimize the total cost of energy service over time. There are, of course, other reasons for public investment besides minimizing the cost of energy service such as preventing environmental damage or assuring universal service. For all of these reasons as well as other societal goals, policy-makers and utilities have chosen to direct public investment toward energy efficiency, renewable resources, and low-income services.

Strategies

The discussion of strategies below is organized as follows:

A brief discussion of potential criteria for accomplishing electric system benefits "fairly, efficiently, and effectively". (9.6.3)

A description of the two primary sources for public investment in electric system benefits:

- electric system revenues (system benefits charge) (9.6.4) and
- tax revenues or incentives (9.6.5)
- A discussion of options for administering public investment in electric system benefits (9.6.6)
- A description of other policy strategy alternatives that may require little or no public investment. (9.6.7)
- A description of alternative means for assessing and coordinating public investments in electric system benefits (9.6.8)

As elsewhere in the report, discussion and description of strategies does not imply a recommendation on the part of CTED and/or the WUTC.

9.6.3 Delivering electric system benefits "fairly, efficiently, and effectively"

ESSB 6560 calls for strategies to achieve conservation, renewable resource, and low-income service delivery goals "fairly, efficiently, and effectively." These qualities are, of course, in the eye of the beholder. However, input from stakeholders suggests that the following criteria for funding and administration of electric system benefit initiatives may help in the evaluation of alternative strategies. They represent a collection of perspectives on the subject, not a consensus.

Attributes of a fair strategy include:

- *Competitive neutrality:* The mechanisms for funding or administering these initiatives would confer no undue competitive advantage on any firm or industry.
- *Accountability:* Decision-making should be transparent, results should be evaluated, documented, and used to inform future program decisions. Program administrators should be accountable for results.
- *Equitable distribution of the costs and benefits of public investment:* Investment in electric system benefits may targeted to maximize achievement. However, all customer classes and locations that contribute to such investments should have some ability to benefit from them.
- *Appropriate funding:* The source and level of funding should bear a logical relationship to the nature of the investment.

An efficient strategy would:

- Minimize administration and overhead so that the largest possible proportion of investment goes directly toward achievement of program goals.
- Use market forces to deliver electric system benefits wherever possible and focus collective efforts on areas where the market does not deliver these benefits. Public investment would be administered in a way that encourages rather than supplants private investment.

- ❖ Use simple methods for collecting funds, administering programs, and evaluating and reporting results.
- ❖ Minimize the ratio of investment to achievement.

An effective strategy would

- ❖ Achieve the maximum level of cost-effective conservation, significantly accelerate the development of renewable resources, and deliver needed low-income services.
- ❖ Have clearly articulated goals and sufficient resources and authority to accomplish them.
- ❖ Align the incentives of the program administrator with the achievement of results and minimize conflicting incentives.
- ❖ Have strong stakeholder support and involvement.
- ❖ Use empirical evidence to assess results and adjust investment levels and strategies accordingly.

These criteria may be used to evaluate alternative methods of funding and administering efforts to deliver electric system benefits. Some of these alternatives are described below.

9.6.4 Public investment through electric service revenues: System Benefits Charge

System Benefits Charge - Background: Much of the historical public investment in energy efficiency, renewable resources, and low-income services, particularly at the state level, has been funded by electricity system revenues. Utilities have included the cost of these investments in their bundled rates, often as part of the cost of implementing their least-cost plans. The rationale for including these investments in utility rates (as opposed to other forms of public investment) grows from the connection of these purposes to the basic policy goals for energy service. The two basic energy policy goals that these investments typically serve are: 1) minimizing the total cost of energy service and 2) ensuring access to affordable energy service for all consumers. Energy efficiency, renewable resources, and low-income services are directly related to the achievement of these two basic goals. This distinguishes them from other policy initiatives with little or no connection to energy service goals that receive public support from tax revenues.

Where energy efficiency and renewable resources represent cost-effective alternatives to other power supply sources, then their costs are collected in electricity rates for the same reasons that the cost of conventional power plants are collected in rates. Where investments in low-income services are not strictly cost-effective from a resource acquisition perspective, the rationale for including them in electric service rates may rest more on the notion of universal service. This is akin to including many of the extra costs of serving low-density rural systems or remote users in general rates in order to ensure affordable service for all.

For reasons documented above, utility investment in these purposes is generally down sharply in recent years. While some of the reduced investment is justified by lower wholesale power costs (and therefore reduced availability of cost-effective conservation and renewable resources), competitive pressures have also been a major factor. In response to these competitive pressures, some Washington utilities (including Washington Water Power and Puget Sound Energy) and a number of states have turned to the "System Benefits Charge" approach. The basic purpose of this approach is to ensure that all consumers share the cost of these investments, regardless of their choice of power supplier.

A System Benefits Charge (SBC) is a uniform, competitively neutral, non-bypassable charge assessed on the sale of electricity (and/or other energy) services to all customers for the purpose of investment in electric system benefits. As a result, differential exposure to the cost of these investments does not become a source of competitive advantage for any supplier or consumer. The mechanics of the SBC represent an accounting change that separates the cost of these investments from general rates and assesses them in the form of a delivery charge.

System Benefits Charge: Applications

A System Benefits Charge can be used to support existing and new approaches to delivering energy efficiency, renewable resources, and low-income services. The following examples are by no means exhaustive, but are meant to suggest some of the existing and new approaches to delivering these benefits.

9.6.4.1 Energy efficiency initiatives

- *Local energy efficiency programs.* Washington's electric utilities have operated a wide variety of local energy efficiency programs for over two decades. These programs include: paying part of the cost of energy-saving equipment; making loans or offering incentives for the purchase of energy-saving equipment; design and technical assistance; weatherization; window upgrades; appliance rebates; efficiency measures for irrigated farms; education or marketing programs promoting energy efficiency and/or resource management; commercial building design assistance; industrial audit and process retrofit programs; industrial motor rebate programs; and others.

Market transformation: Market transformation is a relatively new approach that focuses on making far-reaching structural changes in the market for energy efficient products and services. Market transformation initiatives are generally designed to ensure that changes in the market will be accomplished in a way that reduces or eliminates the need for public investment over time[38] The Comprehensive Review recommended that a portion of revenues from a SBC be allocated specifically to market transformation.

Low-income weatherization: Revenues from a SBC can be used to complement federal investments in low-income weatherization. Low-income weatherization programs may not meet conventional cost-effectiveness criteria for utility resource

acquisition. However, they provide ancillary benefits that help to ensure affordable and adequate electric service for low-income households.[39] The Comprehensive Review recommended that a portion of SBC funds be allocated to weatherization and that weatherization be administered through the existing state and local network of community action programs.

Research, development, demonstration and commercialization: Research and development initiatives for energy efficiency are designed to move energy efficient products down the cost curve so that they may be commercialized in the future. For reasons discussed in the section on technology trends affecting electric service costs (Section 2), R&D investments in the utility industry generally are declining rapidly. Additionally, utility focus on energy R&D has shifted away from collaborative, longer-term projects to those that may help utilities compete in the near term.[40] In four states that have adopted SBCs, R&D for energy efficiency is one of the targeted purposes for investment.

- ❖ Education and information: Consumer investment in energy efficiency is often limited by lack of access to credible, simple information. Utilities and public agencies have historically undertaken a variety of education and information initiatives, including: information clearinghouses such as the Energy Ideas Clearinghouse; demonstration facilities such as the Lighting Design Lab; energy resource and use curricula for schools[41]; energy extension services; marketing information and promotional campaigns for energy efficient products; billing information describing energy use patterns and energy-saving strategies. Information programs can be run in conjunction with other strategies (such as loans or rebates) to help maximize the effectiveness and/or minimize the cost of such strategies.

9.6.4.2 Renewable resource initiatives

- ❖ Compensation to consumers or energy service providers for the above-market cost of renewable resources. Utilities that purchase renewable resources could use SBC revenues to offset some or all of the difference between the cost of those resources and the cost of other available alternatives. The incremental cost that would be funded through the SBC could be minimized in a variety of ways, including competitive bidding or a production incentive program. Production incentives could be allocated competitively and phased out after a relatively short period, which allows for recovery of some of the initial capital costs of the facilities.[42] This would encourage the initial development of resources with strong potential to attract and sustain private investment over time. Alternatively, where consumers may choose renewables, compensation for some or all of the above-market costs could be available to retail customers.
- ❖ Purchasing or providing incentives for distributed renewables. In some remote locations, distributed renewables including solar and wind may already be cost-effective because of their ability to displace expensive

investments in low-density distribution systems. SBC funds could be used to increase the application of these resources through: direct purchases; loan programs; matching grants to leverage other sources of financial support for distributed renewables; or technical assistance to consumers who purchase these systems. (Use of distributed renewables by retail customers presents some of the same financial hurdles for utilities as energy efficiency measures, since it generally reduces demand and revenues).

- ❖ Renewable resource research, development, demonstration, and commercialization As noted in the Section 2, RDD&C investment is particularly vulnerable to short-term competitive pressures. RDD&C initiatives could involve partnerships with the many private and public institutions in Washington with experience and knowledge in renewable resources. (Section 3 discusses RDD&C strategies more generally.)

9.6.4.3 Low-income services

- ❖ *Weatherization.* As noted above, SBC revenues can be used to fund low-income weatherization programs that deliver energy savings and help to ensure universal access to electric service.
- ❖ *Energy efficiency initiatives that reduce the operating costs of public housing:* Public housing authorities may be reluctant to make investments in energy-saving construction practices and equipment when their primary goal is to maximize the number of housing units provided. SBC funds can cover some or all of the incremental cost of energy-efficient alternatives to traditional practices. Alternatively, SBC funds can be used as financing for efficient equipment and paid back through savings over time, then reused for new financing on a revolving basis.

Universal service fund The Comprehensive Review recommended establishment of a universal electric service fund to provide bill assistance to households that would otherwise have to pay more than a fixed percentage of their incomes for electric service. Such a fund could apply to gas as well as electricity bill assistance. It could be funded by SBC revenues, federal or state program assistance, private donations, or a combination of sources. An alternative to collecting electric service revenues through a volumetric (per kWh) SBC is to collect them through a fixed retail distribution system access fee or meters charge. This alternative was included in draft legislation considered by the Oregon legislature in 1997 and discussed in the recommendations of the Comprehensive Review.

- ❖ *Conservation fund for low-income residents* Massachusetts created a permanent energy efficiency fund available only to programs serving low-income residences. The costs of such a fund could be collected through a SBC.

9.6.5 Public investment through tax revenues and incentives

At the federal level, tax revenues support significant investments in energy efficiency, renewable energy, research and development, low-income weatherization,

and low-income heating assistance. Federal taxes also provide modest support for the energy efficiency, renewable resource, and low-income service activities of the states through the State Energy Program. State tax revenues could also be used as an alternative to electric service revenues or as an additional source of public investment for most or all of the applications discussed above. Since most funding at the state level has historically been collected from electric service revenues, this would represent a new tax and potentially be subject to I-601 limitations. The section below describes alternative approaches for supporting investment in system benefits from tax revenues.

9.6.5.1 System benefits tax or modified Public Utility Excise Tax

Energy efficiency, renewable resources, and/or low-income services could be directly funded through a state tax designed specifically for those purposes. Any of the applications of a system benefits charge discussed above could presumably be supported by a conventional tax.

Alternatively, utilities could be allowed to take credit against the Public Utility Excise Tax (PUET) for some or all of the cost of investments in qualifying energy efficiency, renewable resources, or low-income services. The PUET is a tax on electricity sales the proceeds of which go into the state general fund, so allowing a credit against the tax is essentially equivalent to spending general fund revenues for these purposes.

An alternative approach would be to replace the PUET with a sales and use tax levied at the conventional sales and use tax rate. Because a sales and use tax would apply to all energy purchases, it would eliminate the unequal taxation of in-state and out-of-state suppliers that may occur under the existing PUET (which only applies to sales from in-state utilities). Since the sales and use tax rate is higher than the PUET, it would also generate more revenues. This would make the change revenue neutral or positive from the perspective of the general fund, while potentially providing a new source of tax revenue for energy efficiency, renewable resources, and low-income services.

9.6.5.2 Other tax incentives

A variety of more targeted tax incentives to support energy efficiency, renewable resources, and low-income services could be considered. A few examples include:

- Reducing the size threshold for renewable resources to qualify for the existing sales tax exemption. Washington currently exempts solar and wind systems larger than 200 kW in capacity from state sales tax. However, a growing share of the market for solar systems in particular is in smaller, household-sized applications. State sales tax and availability of mail order residential photovoltaic systems places the state's solar dealers, installers and distributors at a disadvantage for selling systems locally. The threshold for the tax exemption could be reduced to 100 watts, which would cover most household applications. This strategy may not appreciably increase demand, but it would level the playing field

for in-state suppliers and help build a local infrastructure of qualified businesses to sell and service these systems.

- Supporting extension of the existing federal production tax credit for wind. The federal government offers a tax credit for electricity generated from wind power. The credit is scheduled to expire in 1999. State officials could support extension of this credit.
- Tax credits or deferrals to private developers of energy efficient low-income housing.
- *Tax credits for energy efficiency and renewable resource investments in homes and businesses* Oregon has a long history of granting personal and business income tax credits for energy efficiency and renewable energy investments. This model is obviously not directly applicable in Washington, which has no income tax. However, credits against other taxes, such as the B&O tax, could be considered.

9.6.6 Administration of public investment

The strategies described above address the potential sources of public investment in electric system benefits and some of the potential applications of public investment. This section addresses administration of investment. In particular, it poses alternative answers to the question "Who should administer public investment in electric system benefits?"

The answers to this question may depend on a variety of factors, including the source of the investment. For example, general-purpose governments most often administer tax revenues whereas electric service revenues are most often administered by utilities. The answer may also depend on the specific function; some investments may be most effectively implemented by local agencies while others are more efficiently administered at a statewide, regional, or even national level. The choice of administrative options may also bear directly on the extent to which these purposes are accomplished "fairly, efficiently, and effectively."

A wide variety of entities could conceivably administer public investment in electric system benefits. The discussion below focuses on five alternatives: utilities, the state, general-purpose local governments, non-profit organizations, and consumers. It also describes coordination and assessment functions and alternative ways to administer those functions. These categories are not exhaustive of the possibilities, nor are they mutually exclusive. The discussion of arguments for and against each approach is meant to be illustrative of the issues that arise under each alternative. The description of these arguments does not imply any judgement about which approach is preferred.

9.6.6.1 Utilities as administrator

- *Arguments for:* Utilities have traditionally administered much of the public investment in energy efficiency, renewable resources, and low-income services, particularly the investments that use electric service revenues as the funding source. Utilities generally have an established

relationship with customers that may facilitate effective administration. They have a regular, familiar communication device in the form of monthly billing. Metering equipment potentially provides another form of interaction and communication with consumers. (Some stakeholders argue, however, that billing and metering should be subject to competition.) Most utilities have experience administering energy efficiency initiatives and low-income services, and many have some experience with renewable resources. The narrower geographic scope and electric service orientation of utilities may be particularly appropriate for administering local conservation programs tailored to local needs and opportunities.

- *Arguments against:* Utilities' financial interests may be increasingly misaligned with the public interest in securing electric system benefits. Because their net revenues are generally a function of their electricity throughput, utilities may be reluctant to achieve energy savings. Successful energy efficiency initiatives, distributed renewables, and low-income services generally reduce utility revenues. This acts as a disincentive to making these investments and making them "effectively;" the more "effectively" a program saves energy, the greater its tendency to reduce revenues. This disincentive is exacerbated by near-term competitive pressure to minimize prices, since even cost-effective investments in energy efficiency may put upward pressure on prices. This disincentive may be mitigated by adoption of a competitively neutral funding mechanism such as the SBC. It may also be mitigated by adjustments to ratemaking formulas that change the relationship of net revenues to electric sales volumes[43].

9.6.6.2 State as administrator

- *Arguments for:* In some states that have adopted a system benefits charge, a state agency administers the funds. Since states generally do not sell power, they do not face the disincentive associated with revenue reductions. State administration may facilitate simpler, more effective evaluation of results, to the extent that it is easier and less intrusive to track the activities of a single agency than it is to track numerous utilities or local governments. Economies of scale may be gained by administering programs on a statewide basis. Statewide administration may allow investments to be allocated where the opportunities and needs are greatest, maximizing the total return on public investment. The statewide scope and general-purpose focus of state government may be particularly appropriate for administering investments in codes and standards, market transformation, and research and development.
- *Arguments against:* Investments administered by the state may not be informed by the same level of understanding of unique local needs and circumstances as investments administered locally. By targeting resources to maximize return on public investment, a state administrator may distribute resources in a geographically uneven way, raising equity

concerns. State administration of these programs may introduce an unnecessary layer of bureaucracy that reduces local control. To mitigate this problem, a state administrator could award public investment funds by competitive bid[44], allowing utilities and other providers to compete to provide the most effective programs and minimizing the state's involvement in program implementation. As a general-purpose government, the state may face competing pressures and goals that detract from its focus on achievement of energy efficiency, renewable resources, and low-income services. States may also face staffing restrictions and inflexible contracting procedures.

9.6.6.3 Local governments as administrator

- *Arguments for:* Many of the arguments for local administration of public investment apply to local governments as well as utilities. General-purpose local governments arguably offer a more direct form of local control than utilities. Unlike most local utilities, however, most general-purpose local governments do not face a direct disincentive to effective implementation of energy saving strategies, because their revenues are not strongly dependent on electric power sales. Administration of public investment by general-purpose local governments may also facilitate integration of electric system benefits initiatives with related programs such as water resource management. Administration by county governments, which are authorized as administrative agents of the State, may be a way to help reconcile state interests with the desire for local control. Local, general-purpose governments may be particularly effective in capturing economies of scope associated with coordinated resource management activities.
- *Arguments against:* General-purpose governments may not have the experience and expertise necessary for administering electric system benefit investments. Because these investments are directly related to the basic goals and functions of electric service, they may be best administered by entities with a narrower focus on electric service delivery. To the extent that local governments provide direct accountability, some of this benefit is offset by the fact that much of Washington is already served by consumer-owned utilities. Because of their general purpose obligations, local governments may understandably be inclined to focus limited resources on priority issues for which they are directly responsible (such as public safety) to the exclusion of electric system benefits. Insofar as electric service revenues fund public investments in electric system benefits, this pressure to devote available resources to general-purpose government priorities may raise equity concerns.

9.6.6.4 Non-profit organization as administrator

- *Arguments for:* Many of the arguments for a state administrator would also support a non-profit organization. Such an organization could be statewide in scope, allowing economies of scale and targeted investment

to maximize returns. A non-profit organization would not face conflicts associated with reduction in revenues due to successful program implementation. Unlike general-purpose government, a non-profit organization could be directly accountable to energy stakeholders through a board comprised of a balanced representation of energy service providers, consumers and other stakeholders. Such a board could be tightly focused on achievement of electric system benefits, and therefore not face the multiple pressures and objectives faced by general purpose governments. A non-profit organization may be particularly effective in administering market transformation, research and development, or other investments that require coordination among interest groups and a shared focus on electric system benefits.

- *Arguments against:* Many of the arguments against a state administrator apply equally to a non-profit administrator, insofar as a non-profit would be statewide in scope. A non-profit organization would require a new accountability structure, whereas utilities and general-purpose governments have built-in accountability structures. While the non-profit board would allow for direct representation of stakeholders, the competing interests embodied in its governing structure could limit its effectiveness and efficiency.

9.6.6.5 Consumers as administrator

Consumers could administer public and private investment by taking credit against system benefits charges or taxes for qualifying energy efficiency and renewable resource activities in their own facilities.

- *Arguments for:* To the extent that energy efficiency and renewable energy investments provide a direct benefit to the facilities in which they occur, this approach could help align costs and benefits. Consumers would have a particularly strong stake in ensuring delivery of results, since they would bear the costs and benefits more directly. Administration could be fairly simple, especially for larger customers, insofar as it would rely on existing models and mechanisms for claiming tax credits. This approach may be particularly suited to energy efficiency investments with unique characteristics that do not lend themselves to more generalized program approaches, such as industrial process improvements.
- *Arguments against:* This approach could reduce achievement of system benefits by allowing public investment to be used for measures that market forces are capable of delivering. If consumers can claim credit for investments with very short payback periods, for example, then public investment may replace rather than encourage private investment. Since this approach would entail a much larger number of entities, administration could be complicated and accountability could be unclear. This approach may raise equity concerns, since not all consumers have equal ability to conceive and administer these investments. It may be

poorly suited for investments such as renewable generation, research and development, market transformation, and low-income services that cannot be made in individual customer facilities.

As noted above, these administrative options have different strengths. If public investment is to be administered fairly, efficiently, and effectively, one size may not fit all; determination of the appropriate level of administration depends on the specific purpose and the unique aptitudes of the different administrators.

9.6.7 Other policy strategies to secure electric system benefits that may require little or no direct public investment

The discussion above focuses on funding and administrative strategies for energy efficiency, renewable resources, and low-income services that require some level of public investment. Alternative strategies may focus primarily on improving the incentives for private investment in these purposes. They may be used in combination with public investment strategies or independent of them.

9.6.7.1 Policy strategies for energy efficiency

- *Energy Codes* Energy code improvements have delivered substantial energy savings to Washington consumers over the past 15 years. Residential and commercial codes in Washington will have captured over 270 aMW in cost-effective savings up through 2003. Energy codes may promote equitable achievement of energy efficiency goals, since they tend to align the costs and benefits of energy efficiency investments. Codes could be examined and updated to incorporate new cost-effective measures on a regular cycle to coincide with other routine code updates. (However, frequent code changes can undermine compliance by preventing users of the code from gaining familiarity with rapidly changing provisions.) Adoption of and compliance with energy codes generally requires some familiarity with the new practice on the part of designers, builders, and building code officials. Code improvements in Washington to date would probably not have been possible without public investment in new energy efficiency technologies and in education, training and compliance activities. However, these public investments are generally modest relative to the magnitude of the savings achieved.
- *Product efficiency standards.* Unlike building codes, product efficiency standards are generally the province of federal rather than state or local government. However, state officials can and do play a significant role in the adoption of federal appliance efficiency standards. (Washington State participation in development of national product efficiency standards has decreased significantly in recent years.) Here again, codes and standards generally do not “push the envelope” on new energy efficiency technologies; they are generally preceded by public and private investments in research and commercialization of new technologies. However, they can substantially increase efficiency by adjusting industry standard practices to keep pace with commercialization of proven, cost-effective technologies.

- *Establish energy savings targets for public facilities*. Public facilities are often major energy consumers. The world's largest energy consumer is the U.S. federal government. Federal Executive Order 12902 requires federal agencies to substantially reduce their energy consumption over time. Non-federal public facilities in Washington State spent nearly $200 million per year for electricity in 1990, the last year for which data are available. One study estimates that up to one-quarter of that expenditure could be reduced cost-effectively by energy conservation measures and energy efficient operations[45]. State law (RCW 39.35) requires life cycle cost analysis for all new and remodeled public facilities. However, implementation of this requirement is sporadic and even when the analysis is conducted, cost-effective energy efficiency opportunities are often missed.

Capturing energy savings can reduce the cost of providing public services and/or free up public funding for accomplishment of other public priorities. However, the same market barriers and short-term cost pressures that prevent private investment also affect public agencies. Lack of coordination between state capital and operating budgets impedes capital investments that reduce operating costs. Like their counterparts in the private sector, public facility managers may be reluctant to make investments in energy efficiency unless they produce positive net cash flows from the outset. This can frequently be accomplished through the use of Energy Savings Performance Contracts in which public agencies defray first costs by pledging a percentage of energy savings to repay financing costs.[46] Energy efficiency in public facilities can also be enhanced through comprehensive building commissioning to ensure optimal performance and training and support of resource conservation managers who can maintain and improve energy performance over time. The general approach of establishing public facility targets can also be applied to renewable resource use. The federal government presently encourages agencies to use renewables and provides technical and contracting assistance to agencies that choose to do so.

9.6.7.2 Policy strategies for renewable resources

- *Portfolio standards:* Portfolio standards establish a requirement for power suppliers to provide a minimum proportion of their power from renewable resources. State policy-makers could support a federal renewable portfolio standard (RPS) or adopt one at the state level. Some national restructuring proposals would establish a RPS. Most proposals would attempt to minimize the cost of meeting the standard by allowing suppliers either to acquire the output of renewables or purchase credits toward the requirement from suppliers who have more than the minimum requirement. A state portfolio standard may be somewhat more difficult to administer, due to complications associated with extensive interstate electricity sales. However, seven states have adopted portfolio standards.

Portfolio standards represent a direct policy choice to deliver a certain proportion of renewables rather than to provide public investment or subtly change market incentives. As such, they are sometimes viewed as excessive intervention in private markets. However, others argue that by establishing a goal for renewable resource achievement and then letting the market achieve that goal as efficiently as possible, portfolio standards minimize the need for government involvement in implementation.

- *Fuel and emissions disclosure and labeling.* This strategy would attempt to improve the ability of the market to deliver renewable resources by providing better information to consumers about environmental characteristics. [47] (The impact of this strategy would clearly be more pronounced in a retail access environment or where consumers may choose renewables. See following strategy.) This strategy requires development of a standard tracking mechanism for wholesale transactions and a standard labeling format for communicating fuel mix and emissions data to consumers. (Development of a tracking system for the western interconnection is currently under way[48].) In addition to facilitating market functions by providing information, this strategy may also build consumer confidence by ensuring that consumers know what they're getting when they choose "green" electric power products. This strategy is discussed at length in the study prepared for the Legislature under HB 2831.
- *Delivery of renewable resources to customers who choose them.* The Comprehensive Review recommended that retail utilities provide direct customer access to renewable resources in advance of any action with respect to retail access generally. Alternatively, utilities could be required or encouraged to offer a green option for consumers who request it. This strategy could be combined with public investment to buy down some or all of the incremental cost of renewables for the customers who choose them. This strategy would allow the preference that consumers frequently articulate for renewables in polls to be expressed as a market proposition, and thereby build the market for renewables. However, this strategy would not address underinvestment due to the "public goods" quality of renewables[49].

Internalize environmental costs Prices that accurately and fully reflect costs are one of the preconditions for efficient operation of competitive markets50. One reason that private investment in energy efficiency and renewable energy may not be sufficient to minimize total costs is that many of the environmental costs of energy remain external to price. Internalization of environmental costs would raise prices for some energy resources, but may encourage minimization of total costs and enhance private investment in energy efficiency and renewable resources. The costs associated with carbon dioxide emissions are perhaps the largest external cost of fossil-fueled energy resources, because these emissions are unregulated. Options for internalizing the cost of carbon dioxide emissions include state or federal emission standards and carbon taxes. (See Section 2 for further discussion

of external electricity costs.) Carbon taxes could be structured to be revenue neutral by offsetting other taxes, or they could be used as an alternative to the system benefits charge and tax options discussed above. A market-based strategy for internalizing environmental costs is to establish a standard (based on scientific and/or policy determinations) and then establish a system of tradable credits that allows the standard to be met with the least costly mix of mitigation strategies. This is the strategy advocated by U.S. representatives in global climate treaty negotiations. It is also the strategy used to minimize the cost of sulfur dioxide reduction in the Clean Air Act.

9.6.7.3 Policy strategies for low-income services

- *Rate Discounts* A rate discount for low-income service could be adopted in legislation or required by state or local utility regulators. Massachusetts law, for instance, requires that utilities provide rate reductions of 25-35%. (Rate discounts currently offered by Washington utilities are discussed in 9.4.2 “Program Descriptions”.) There is some question as to whether and under what conditions current Washington law authorizes the WUTC to adopt special rates for low-income customers[51]. Rate discounts could be partially or fully supported by public investment in the form of SBC funds or tax revenues.
- *Universal electric service based on percent of income* Clark County PUD guarantees that low-income consumers will not be disconnected or charged additional fees if they spend at least 9 percent of their income on their electric power bill. This mechanism tends to index the level of assistance to the level of need. Utility evaluations of the program indicate that the utility has experienced improved payment collection from these customers as a result of the program. Public investment funds (SBC or tax credits) could be made available for some or all of the difference between the actual bill and the percent-of-income threshold for utilities that elect to use this approach. (Public investment may not be necessary, however, to the extent that the program decreases costs for utilities, as it apparently has for Clark.) Some state regulatory commissions including Ohio and Pennsylvania require such programs for their jurisdictional utilities due to the financial savings associated with improved payment collection. Utilities serving areas with disproportionately large low-income populations may find this approach more difficult.

9.6.8 Coordination and assessment

Regardless of which entities administer investments and which policy strategies are employed, there are a number of functions that may require cooperation and coordination among the many entities involved in delivering electric system benefits. These functions may include, but not be limited to:

- Assessment and periodic reevaluation of the appropriate level of public investment.

- ❖ Establishment of performance objectives and tracking of achievement of those objectives.
- ❖ Development of strategies to ensure that public investment encourages rather than supplants private investment and facilitates the efficient functioning of markets for energy efficiency and renewable resources.
- ❖ Identification of opportunities to achieve system benefits more effectively and efficiently.
- ❖ Identification of opportunities to form partnerships among the many private and public institutions involved in energy efficiency, renewable resources, and low-income service delivery.
- ❖ Participation of energy service providers, consumers, and other stakeholders in crafting policies and procedures to improve delivery of electric system benefits over time.

Some of these functions may be performed at the regional level by the Regional Technical Forum that the Northwest Power Planning Council proposes to form.[52] To the extent that these functions are not performed by the RTF (or that they need to be performed at a state level) the state could:

- ❖ Form an electric (or energy) system benefits board comprised of electric service providers, consumers, and other stakeholders to fulfill these functions. The responsibilities of such a board could be limited to periodic assessments of electric system benefits achievements and investments. Or its responsibilities could be as broad as administration of competitive bids for delivery of electric system benefits. It could focus only on administration of public investment in electric system benefits, or it could also focus on other policy strategies to achieve these benefits that may not require direct public investment.
- ❖ Alternatively, assign the coordination and assessment functions described above to existing institutions. A stakeholder advisory group could be formed to guide such institutions in their administration of coordination and assessment functions.

Endnotes for Section 9

[1] Clean Air Act of 1970 (PL 91-604), Amendments of 1977 (PL 95-95), Amendments of 1990 (PL 101-549)

[2] Public Law 96-501, Pacific Northwest Electric Power Planning and Conservation Act, December 5, 1980

[3] Clearing Up, no. 777, May 27, 1997, 4.

[4] Clearing Up, no. 764, February 24, 1997, 4.

[5] Green Book, NWPPC.

[6] NWPPC, 1996 Draft Power Plan.

[7] Marvin Brown, "Miss Liberty's energy diet", Hart's Energy Markets, June-July 1998, 13-20.

[8] Washington State Department of General Administration brochure, "Energy Savings Performance Contract."

[9] US General Accounting Office, August 1996. Federal Research: Changes in Electricity-Related R&D Funding. GAO-RCED-96-203. Washington, DC.

[10] ECONorthwest, The Next Generation of Energy, CTED, August 1998.

[11] Last year, the Washington legislature past "net metering" legislation that allows excess solar electricity produced in grid-connected residential applications to be credited against the customer's power bill.

[12] Northwest Power Planning Council, 1996; Lafond, 1992.

[13] The Intergovermental Panel on Climate Change, a panel of world scientists considered to be the world's most authoritative scientific body on climate change, has concluded that stabilizing the climate requires reducing carbon dioxide (CO2) emissions by 50 to 70 percent. Intergovernmental Panel on Climate Change, "IPCC Second Assessment Climate Change 1995." United Nations.

[14] Northwest Power Planning Council, 1996.

[15] ECONorthwest, 1998.

[16] List the three: ITT Rayonier, Port Angeles; Gorge Energy, Bingen;

[17] WSU Energy Program; Nelson, 1998.

[18] IPCC, First Assessment Report, August 1990, cited in Australia Department of Environment and Heritage, News of the Intergovernmental Panel on Climate Change Vol 1 No 1 - December 1993, http://www.environment.gov.au/portfolio/esd/climate/air/climate/clim_change/ipcc1_1.html

[19] Holt, Edward, "Information Consumers Want In Electricity Choice: Summary of Focus Group Research." The National Council on Competition and the Electric Industry, December 1997.

[20] Economists distinguish between "internal costs" - those that are recognized and recovered in the price of goods and services - and "external costs" - the costs of "consequences and damages which third persons or the community sustain as a result of productive processes." K.W. Kapp, "The Societal Costs of Private Enterprise." Cambridge, Mass: Harvard University Press, 1950.

[21] Rader and short, 1998.

[22]Clearing Up, No. 848, October 12, 1998, 7-8.

[23] ORNL, Progress Report of the National Weatherization Assistance Program, September 1997

[24] CTED, "Weatherization Works in Washington." n.d.

[25] National Consumer Law Center, Energy and Utility Update, Nov/Dec 1997, 2.

[26] Steve McLellan , WUTC, "Low income weatherization," February 11, 1992.

[27] Washington State University Energy Extension, http://web03.energy.wsu.edu/org/wa-enrgy/

[28] Clark PUD, Evaluation of GOSP, September 14, 1990.

[29] NCLC, Energy and Utility Update, Nov/Dec 1997, 3.

[30] "Weatherization Works in Washington."

[31] Statistical Abstract of the United States, 1997, Washington State, http://www.census.gov/statab/www/states/wa.txt.

[32] OFM, Washington State Data Book 1997, Table ST01.

[33] Kushler, Martin, An Updated Status Report of Public Benefit Programs In An Evolving Electric Utility Industry, American Council for an Energy Efficient Economy, September 1998.

[34] Levine, M, E. Hirst, J. Koomey, J. McMahon, and A. Sanstad, 1994. Energy Efficiency, Market Failures, and Government Policy. LBL-35376; ORNL/CON-383. Berkeley, CA: Lawrence Berkeley Lab.

[35] Ibid.

[36] Meier, Alan and J. Whittier, 1983. "Consumer Discount Rates Implied by Purchases of Energy-Efficient Refrigerators." Energy. 8(12):957.

[37] Northwest Power Planning Council. 1996. Fourth Northwest Conservation and Electric Power Plan. 96-5A. Portland, OR: Northwest Power Planning Council. p G-18. This estimate is based on an assumption that consumers will purchase all

energy-saving equipment that pays for itself in energy savings within three years. Anecdotal evidence suggests that for many purchasing decisions, consumers require an even shorter payback period.

[38] Commonwealth of Massachusetts Department of Public Utilities, Electric Industry Restructuring Plan: Model Rules and Legislative Proposal, D.P.U. 96-100, 12/30/96. (pp. A-17)

[39] Barry, L., M. Brown, and L. Kinney, 1997. Progress Report of the National Weatherization Assistance Program. ORNL/CON-450. Oak Ridge, Tennesee: Oak Ridge National Laboratory.

[40] General Accounting Office, August 1996. GAO-RCED-96-203. Federal Research: Changes in Electricity-Related R&D Funding. Washington, DC: United States General Accounting Office.

[41] For example, SPI's "Food and You" curriculum included an energy efficiency component.

[42] Tutt, Timothy, California Energy Commission. 1998. Bidding the Green: Incentivizing New Renewable Power Development in California. Proceedings of ACEEE 1998 Summer Study on Energy Efficiency in Buildings.9.223-9.233

[43] For example, the Oregon PUC has adopted an "alternative form of rate-making" for PacifiCorp in which distribution revenues are not a direct function of electric sales volumes. This means that PacifiCorp will not suffer a reduction in distribution revenues due to successful energy efficiency initiatives. A similar rate-adjustment mechanism was implemented for Puget Sound Power and Light Company in the early 1990s. Due to unintended consequences it was discontinued by the WUTC in 1995.

[44] Massachusetts, California, and Rhode Island will use competitive bidding processes to allocate at least some of their energy efficiency funds. See Kushler, M. September 1998. An Updated Status Report of Public Benefit Programs In An Evolving Electric Utility Industry. Washington DC: American Council for An Energy Efficient Economy

[45] Ecotope, Inc. Energy Conservation in Public Buildings, April 15, 1991 report for the Washington State Energy Office. This report is based on 1990 data. However, energy savings potential has probably not changed dramatically, because the estimates of cost-effective potential were based on retail prices (which have not declined) rather than "avoided costs" (which have declined substantially since 1990).

[46] Washington State Department of General Administration brochure, "Energy Savings Performance Contract."

[47] The Regulatory Assistance Project. The National Council on Competition and the Electric Industy Synthesis Report: A Summary of Research on Information Disclosure. April 1998. Gardiner, Maine.

[48] Washington Commissioner Bill Gillis and staff joined utility commissioners and staff from eleven states and British Columbia on a Western Disclosure and Tracking Project. The objective of the project is to develop a mechanism to track electricity generation attributes from the source to the end user. Since electricity is traded regionally, tracking will be much easier if the Western grid develops a common system. The group reached consensus this summer on a preferred approach: a "claims-based certificate" tracking mechanism, in which a neutral third party (a "regional clearinghouse") would issue certificates to electricity generators based on their generation; generators could sell the certificates to marketers or keep them; any electricity retail seller must possess certificates to justify any claims they make about their product. Details of the proposal are still under development.

[49] Perhaps because of these "public goods" characteristics, some surveys indicate that consumers would prefer that all customers share the cost of delivering these resources rather than just those who elect to pay more. See, for example, "Study of PUD Customer Acceptance of Renewable Energy." Final report prepared for CARES by Gilmore Research Group, November 1997, p. 2. "There is strong support to spread the costs of new renewables across the customer base, rather than just among the customers who support developing these sources."

[50] Energy economics literature contains numerous descriptions and analyses of the external costs of electric power production as well as the general theory of externalities. Perhaps the most comprehensive review of the literature is contained in Environmental Costs of Electricity, Pace University Center for Environmental Legal Studies, 1990.

[51] An Attorney General's opinion has held that the WUTC does not have authority to extend rate discounts to low income residents because it would constitute unreasonable discrimination or be unduly preferential (in violation of RCW 80.28.080) and because the provision allowing reduced rates does not apply to low-income persons because they would not be considered indigent or destitute (RCW 80.28.080).

[52] Northwest Power Planning Council, July 1998. "Draft Proposal for Initiating the Regional Technical Forum." 98-18. Portland, OR: Northwest Power Planning Council.

[TE1]Approximately 105 MW from HUD code update & 165 from improved practice over new HUD due to MAP)